



ENVIRONMENTAL RESEARCH:

A Decade of Accomplishments 1990-2000

FEDERAL HIGHWAY ADMINISTRATION

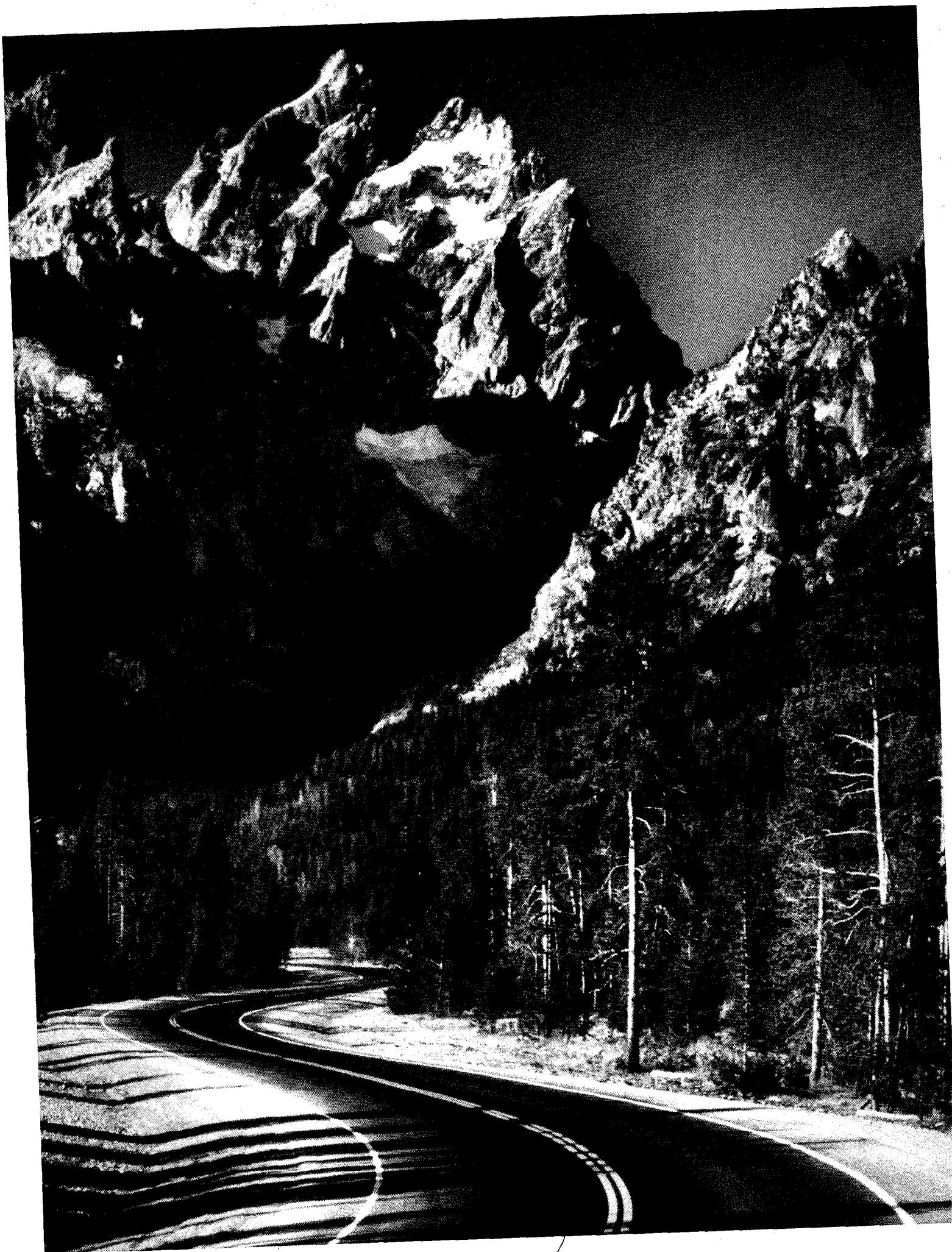
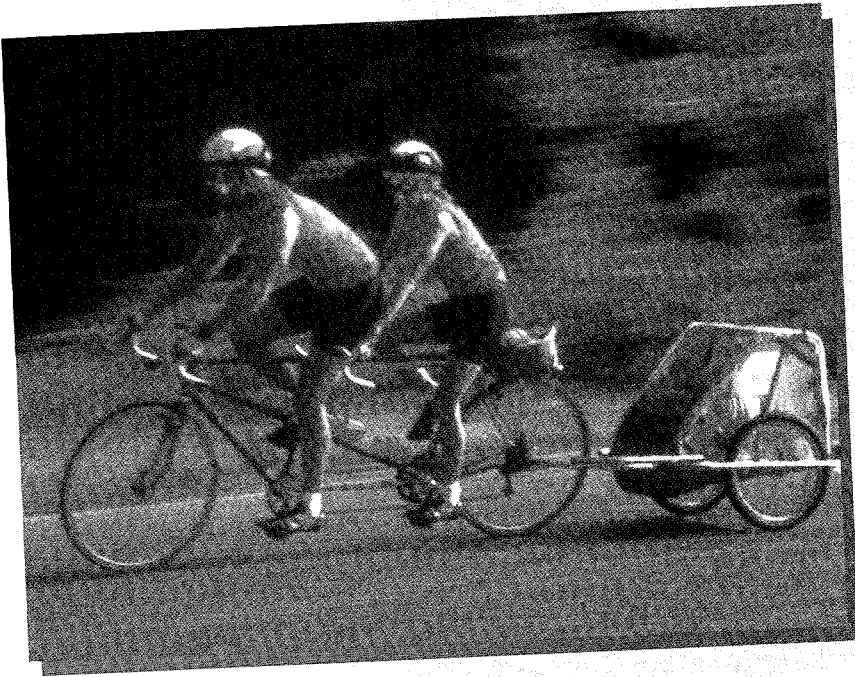
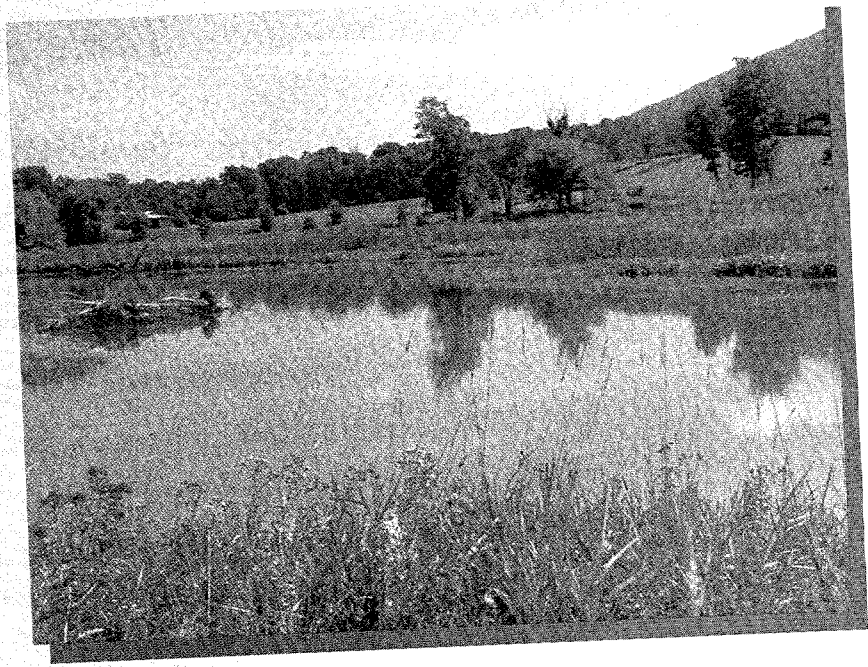


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Natural Environment



Human Environment

Integrated Decisionmaking



• *Introduction*

Transportation, whether it is the mode of getting from one point to another (automobile, train) or the superstructure that supports it (road, bridge), has impacts on communities, people, and the environment. Research is needed to fully understand the impacts of individual transportation projects and their interactions on the livability and sustainability of the natural and human environment. In recognition of this need, the Federal Highway Administration (FHWA) has supported, over the past 10 years, environmental research activities that totaled more than \$30 million and has renewed its commitment to technology transfer and training in this area.

The FHWA Environmental Research Program (ERP) conducts and supports research related to the design, planning, construction, operation, and maintenance of transportation systems and their impacts on the human and natural environments. The research activities of the ERP are designed to provide the most effective and efficient transportation systems possible, while simultaneously protecting, preserving, and enhancing all elements of our environment.

This report documents the completed and ongoing research activities of the ERP and highlights the most significant accomplishments. In addition, it provides information to the transportation and environmental research communities about our program. It is a resource that may be used by the FHWA's many constituencies, such as State Departments of Transportation (DOTs); Metropolitan Planning Organizations (MPOs); environmental organizations; academic institutions; the interested public; and others, including the U.S. Congress.

• *FHWA's Mission and Vision*

The mission of the FHWA is to continually improve the quality of our Nation's highway system and intermodal connections. The FHWA includes, as one of its five strategic goals, the need to carry out its mission in a manner that protects and enhances the natural environment and communities affected by transportation. The FHWA's other strategic goals focus on mobility, safety, productivity, and national security. The goal to protect and enhance the environment and communities affected by transportation requires that principles of environmental stewardship be incorporated in all of the FHWA's policies, procedures, and decisions. This means that the FHWA responsibly considers and evaluates all aspects of the environment throughout the highway design, planning, and development process. Beyond its obligations embodied in environmental stewardship, the FHWA must demonstrate leadership on environmental matters with State and local agencies that implement transportation projects and programs throughout the country.

• *FHWA's Role in Environmental Research*

Over the years, the role of the FHWA has evolved and the Agency has expanded its mission beyond that of constructing a nationwide transportation system that is safe, reliable, and efficient. During the 1990s, the FHWA's role broadened to reflect increasing interest throughout the nation in developing an environmentally sensitive transportation system. This role change occurred for several reasons. The most important was the enactment of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and the Transportation Equity Act for the 21st Century (TEA-21) in 1998. In enacting ISTEA and TEA-21, the U.S. Congress emphasized the need for an integrated and multimodal transportation system that reflects environmental sensitivity and community values. The renewed emphasis on the environmental and community impacts of transportation changed the framework of transportation planning and decisionmaking and vastly expanded the number of stakeholders who have an active interest in the FHWA's programs and policies.

• *FHWA's Environmental Research Program (ERP)*

Since 1990, environmental research at the FHWA has been supported and managed by the Planning and Environment Core Business Unit (formerly the Office of Environment and Planning). Through the coordinated activities of the ERP, tools are developed which will increase our understanding of how transportation facilities interact with the environment. The ERP provides updated or state-of-the-art technologies, analytical methods, and predictive models that can be used to make sound transportation decisions, and that reflect sensitivity to environmental and human needs. The research conducted during the past decade reflects the changing needs and interests of our stakeholders and customers and their requests. Many of our research topics have been selected as a direct result of requests received from them.

The FHWA ERP is organized by eight research program areas under three broad focus areas, as described in The Strategic Plan for Environmental Research 1998-2003:

NATURAL ENVIRONMENT

- Air Quality and Climate
- Wetlands
- Water Quality, Habitat, and Ecosystems
- Noise¹

HUMAN ENVIRONMENT

- Communities, Neighborhoods, and People
- Environmental Justice
- Cultural, Historic, Archaeological, and Scenic Resources

INTEGRATED DECISIONMAKING

- Integrated Transportation and Environmental Decisionmaking

The goals and objectives of each of the ERP's eight program areas are detailed in its strategic plan and are summarized in **Table A**.

• *Environmental Commitment*

The commitment of the U.S. DOT and the FHWA to the environment is clearly stated within their respective strategic plans. To support the Administration's environmental goals, the ERP is specifically guided by its own strategic plan. The Strategic Plan for Environmental Research 1998-2003 provides direction and focus for all of the ERP. It expresses our commitment to meet both the transportation and environmental needs of the country by preserving and improving the environment, providing customer service, and establishing partnerships with stakeholders to achieve our mission "to develop and disseminate innovative and effective research products and services that help FHWA and its partners implement surface transportation programs in a manner that protects and enhances the natural and human environment."

¹As a result of FHWA restructuring, the Noise program area is now a part of Natural Environment.

Table A
Environmental Research Program
Focus Areas, Program Areas, and Goals

<i>Natural Environment</i>	Goal: Protect and improve the quality of the natural environment by developing and disseminating the tools and expertise required to predict and assess transportation impacts, apply optimal mitigation and enhancement methods, and support environmentally sound transportation initiatives.
✓ Air Quality and Climate—Program Goal: Develop analytical techniques and cost-effective mitigation strategies to reduce the amount of transportation-related emissions and greenhouse gases.	
✓ Wetlands—Program Goal: Develop tools, techniques, and methods to reduce direct and indirect adverse impacts of Federal-aid highways on wetlands and increase net wetland acreage.	
✓ Water Quality, Habitat, and Ecosystems—Program Goal: Develop tools, techniques and methods to reduce direct and indirect adverse impacts of highways on water quality, habitat, and ecosystems to preserve and enhance human health, biological productivity, and ecological diversity.	
✓ Noise—Program Goal: Develop analysis techniques, abatement methods, and effective noise compatible land use planning tools to reduce the adverse impacts of noise.	
<i>Human Environment</i>	Goal: Protect and enhance the human environment by developing and disseminating the tools, techniques, and expertise required to assess the beneficial and adverse impacts of transportation decisions on communities; apply optimal mitigation and enhancement methods; and support sound and equitable transportation plans, programs, and projects.
✓ Communities, Neighborhoods, and People—Program Goal: Develop and disseminate the skills, tools, and information needed to achieve effective transportation decisionmaking that protects and enhances the human environment and quality of life through full consideration of communities, neighborhoods, and people.	
✓ Environmental Justice—Program Goal: Develop and disseminate the tools and information to assess, prevent, and address potential discriminatory effects and disproportionately high and adverse health and environmental effects of transportation decisions on low-income and minority populations.	
✓ Cultural, Historic, Archaeological, and Scenic Resources—Program Goal: Improve procedural and impact assessment methods for the identification, evaluation, and protection of historic and archaeological resources, and scenic quality.	
<i>Integrated Decisionmaking</i>	Integrated Transportation and Environmental Decisionmaking — Program Goal: Develop and disseminate skills, tools and information to redesign Federal environmental and transportation decisionmaking, and to ensure an integrated process at the Federal, State, tribal, and local levels that achieves the best overall public interest decisions.

• *A Customer Driven Research Program*

The FHWA has embraced the concept of environmental research that is outcome-oriented and responsive to changing customer needs. As a result, the Agency funds and carries out a wide variety of research, spanning the analytical, technical, policy, and planning arenas. The ERP facilitates environmentally sensitive and sound transportation planning and decisionmaking at the State and local levels by: 1) developing improved analytical approaches to understanding and addressing environmental impacts; 2) using technology transfer to communicate information and put tools in place for States and MPOs; 3) analyzing and developing policy options on emerging issues; and, 4) enhancing FHWA training and communications programs.

• *Partnerships and Collaboration*

The FHWA takes its environmental stewardship role seriously and realizes that only by working in partnership with its many stakeholder groups will the goal of environmentally sound investment decisions be achieved. Thus, over the past several years, the FHWA has worked hard to nurture existing partnerships and build new ones. For example, in developing its Strategic Plan for Environmental Research 1998-2003, the FHWA sought out and received input from stakeholder groups, including States, academic institutions, MPOs, environmental advocacy groups, and others. The insights and suggestions of these stakeholders helped shape the strategic plan and have fostered closer coordination of the research program with key stakeholder groups. The FHWA has also made special efforts to include Historically Black Colleges and Universities and Minority Institutions of Higher Education in the research program. The ERP is designed to ensure that research efforts are coordinated, that the financial resources of the FHWA are used wisely, and that research products complement other ongoing efforts, either at the FHWA or in partnership with its stakeholders. Other activities are supported by the ERP, including those of the Transportation Research Board (TRB) and the National Cooperative Highway Research Program.

• *Transportation Environmental Research Program (TERP)*

The FHWA collaborates with other Federal agencies, State and local transportation and environmental agencies, academic institutions, and private organizations to conduct or support research. It also manages programs and activities that encourage such collaboration. One such program is the Transportation Environmental Research Program (TERP), which focuses on colleges and universities to encourage environmental research related to transportation.

Through the TERP, the FHWA hopes to better understand the complex relationships between transportation and the environment. A major benefit of the TERP is the opportunity it creates for students and faculty at colleges and universities to directly participate in the FHWA research program and to contribute by providing solutions to our research needs. The TERP also helps us increase the pool of potential researchers in the fields of transportation and environment so that we can continue to support environmentally sound decisions throughout all phases of highway development.

• *Surface Transportation-Environment Cooperative Research Program (STECRP)*

The TEA-21 called for the establishment of a surface transportation-environment cooperative research program (STECRP). Through the STECRP, research will be conducted on many social, economic, technological, and environmental aspects of transportation. Included in the legislation are five specific issue areas to be addressed by the program:

- Development of more accurate models for evaluating transportation control measures and transportation system design for use by States and MPOs;
- Increased understanding of the factors that contribute to the demand for transportation;
- Development of indicators of economic, social, and environmental performance of transportation systems to facilitate analysis of potential alternatives;
- Analysis of the relationship between highway density and ecosystem integrity, including the impacts of highway density on habitat integrity and overall ecosystem health, as well as development of a rapid assessment methodology for use by transportation and regulatory agencies in determining that relationship; and
- Establishment of additional priorities as determined by the legislatively mandated advisory board and by the National Research Council.

In addition to the specific research areas to be addressed under STECRP, TEA-21 required the establishment of a STECRP advisory board. The advisory board will make recommendations for research on environmental, planning, and energy conservation, technology, and technology transfer activities related to surface transportation. The membership of the advisory board will be broadly drawn from the transportation and environmental research community to include State and local government agencies, academic institutions, environmental organizations, and transit agencies. As provided in TEA-21, some of the research activities of the STECRP will be managed by the National Academy of Sciences. The TRB is currently managing activities related to the establishment and operation of the STECRP advisory board. Other Federal agencies are also involved in the formation and functions of the advisory board, including the U.S. Department of Energy and the U.S. Environmental Protection Agency (EPA). The agenda for the STECRP is ambitious, and the FHWA is confident that the program will be helpful in enhancing coordination of transportation, environmental, and planning research and in the collaborative identification of research needs.

• *ERP Significant Accomplishments in the 1990s*

While numerous research products were developed under the ERP during the 1990s, this section highlights a representative set of accomplishments in each of the three broad focus areas: Natural Environment, Human Environment, and Integrated Decisionmaking. These accomplishments illustrate the types of research undertaken through the ERP—analytical, technical, policy, and planning. Much of the environmental research conducted during the 1990s was in the form of guidance and tools for use by State DOTs and MPOs in making transportation decisions. Over the years, however, new transportation legislation and environmental standards have affected the research perspectives and needs of States and local communities. As those needs and requirements changed, we refocused our research goals, products, and support to reflect and meet them. The FHWA will continue its environmental research responsiveness by developing and improving prediction models, conducting natural resource analyses, and promoting sound environmental practices.

A complete listing of research projects completed during the 1990s or underway is included as the Appendix to this report.

Natural Environment

• *Global Climate Change Literature Review*

This comprehensive literature review of issues related to transportation and global climate change is intended to assist policymakers in initiating the discussion over transportation's role in the global climate change debate during the post-Kyoto era. This review is particularly timely because of the increased attention to global climate change over the past few years, the agreements reached in Kyoto, and the substantial role of transportation in the creation of greenhouse gases (CO₂).

• *Transportation Conformity Reference Guide*

This product provides a comprehensive reference tool on all elements of the transportation conformity process and is designed for transportation agency planners, policy makers, and technical staffs. The guide is organized so that it is easy to look up information on a specific topic or to find more comprehensive information on procedural issues related to the conformity process (e.g., interagency consultation, project level analysis, etc.). Over 40 exhibits are provided to visually portray various elements of the conformity process, and extensive references are provided in each chapter and in the bibliography. The FHWA intends to keep this guide updated so that it may serve as a resource for States and MPOs that are required to comply with the transportation conformity requirements as they evolve.

• *Evaluation of the MOBILE Vehicle Emission Model*

Under the Clean Air Act Amendments of 1990, the EPA requires that States (except California) and MPOs use the MOBILE model for forecasting motor vehicle emissions. Pursuant to the transportation conformity process, the analysis that results from use of the MOBILE model along with regional travel demand forecasts is the basis on which transportation conformity is determined. Since the model has changed over time, this paper was important to users in the mid-1990s because it illustrated the differences between MOBILE 4 and 5 and offered important pointers to modelers in States and MPOs. The EPA is currently working on releasing MOBILE 6, which, once released, will become the required emissions model for all states except California. When MOBILE 6 is released, the FHWA will provide technical assistance to States and MPOs on the use of the model for mobile source emissions forecasting.

- *VMT Growth and Improved Air Quality: How Long Can Progress Continue?*

This booklet explains the relationship between growth in vehicle miles traveled (VMT) and air quality. By showing past trends in air quality improvement nationwide and future emissions reduction trends, it is useful to State DOTs and MPOs in transportation investment decisionmaking.

Atmospheric levels of all four pollutants to which motor vehicles contribute significantly—airborne lead, carbon monoxide, nitrogen dioxide, and ozone—have declined consistently for almost 2 decades. In addition, violations of the National Ambient Air Quality Standards for airborne lead, carbon monoxide, and nitrogen dioxide have been virtually eliminated. Controlling ground-level ozone (or “smog”) has proven more challenging, but violations of the Federal ozone standard have decreased.

Most of the reductions in atmospheric concentrations of these pollutants can be attributed to lower emissions by motor vehicles. Since 1970, tighter emissions standards for cars and trucks have significantly reduced vehicular emissions of carbon monoxide and volatile organic compounds (VOC, a primary ingredient of ozone).

This analysis examines whether reductions in motor vehicles’ VOC and oxides of Nitrogen (NO_x) emissions rates—which are likely to result from recently adopted control strategies—could be offset by continuing growth in vehicle miles traveled during the foreseeable future. It also investigates how rapidly motor vehicle emissions of various pollutants might resume growing if their long-term decline is reversed, and compares the potential future increase in emissions to their historical decline. Finally, the analysis explores how this potential increase in motor vehicle emissions might be postponed by further tightening of new car emissions standards or other proposed emissions control strategies that have not yet been adopted.

In summary, the analysis shows that emission control measures already in effect are likely to extend the decline in motor vehicles’ VOC emissions for at least another decade, and further tightening of new car emissions standards could prolong this decline by approximately another 10 years. In the case of NO_x, tighter standards for new vehicles (trucks and automobiles) are likely to be necessary to achieve the same result, although significant emissions reductions from off-road vehicles and equipment should also be possible.

- *Transportation and Air Quality Public Education Campaign*

This FHWA initiative, in partnership with the Federal Transit Administration and the EPA, is a multiyear effort to support national environmental and transportation objectives through a campaign to increase awareness of the link between travel behavior, traffic congestion, and air quality. The goals of the public education campaign are to improve citizens’ quality of life, health, and the environment through education; increase the awareness of alternative travel modes and the importance of travel choices; and encourage positive behavioral change to reduce transportation-related emissions. The public education campaign, which is conducted at national and local levels, includes advertising as well as pilot tests, with participants representing a broad coalition of interests. The key benefits expected from this initiative are enhanced national and local government partnerships; leveraged resources from a variety of sources; and establishment of a national, sustained effort to reduce emissions and traffic congestion through lifestyle choices and related changes in travel behavior.

- *Wetland Mitigation Database*

The FHWA has recently published a wetlands mitigation accounting database entitled, System for Wetlands Accounting and Management Program, for recording and analyzing wetland mitigation efforts. The program will greatly facilitate wetland mitigation recordkeeping and reporting of wetland loss/gain data. The database, developed through our environmental research program and completed during fiscal year 1998, will provide the State DOTs with a tool for managing their wetland mitigation activities associated with highway improvements.

The database directly supports the FHWA Administrator's fiscal year 1998 and 1999 performance agreements, which call for a 50 percent increase in net wetland area resulting from Federal-aid highway projects by 2008. We have been monitoring performance each year by conducting a national survey of the States for their wetland loss/gain data. The new database will enable the State DOTs to monitor their mitigation performance during the year and easily report the annual results to the FHWA.

- *Wetlands and Highways: A Natural Approach*

This brochure discusses alternative approaches to minimizing wetland loss as well as wetland mitigation projects and mitigation banking to protect wetlands, and highlights 10 wetland mitigation projects that have received acclaim for their innovation and success. The brochure also discusses tips for potential mitigation bankers and provides information on existing and planned wetland mitigation banks throughout the United States.

- *Evaluation and Management of Highway Runoff Water Quality (Water Quality Synthesis)*

This manual consolidates the results of past research on highway runoff and water resources. The single volume manual is useful to highway designers and environmental professionals by presenting the available and appropriate impact prediction and mitigation tools for use during highway project planning and development activities. This manual is a self-contained desk reference for highway practitioners and includes an extensive bibliography.

- *Ultra-Urban Best Management Practice Assessment and Analysis of Highway Stormwater Runoff (original title); Stormwater Best Management Practices in an Ultra-Urban Setting: Selection and Monitoring.*

A compilation of available literature on ultra-urban best management practices (BMPs) resulted in this searchable database on runoff pollution reduction methods suited to limited space application. Included with the database are BMP selection criteria and decision support system, as well as appropriate monitoring design and implementation recommendations.

- *FHWA Highway Traffic Noise Prediction Model*

The new FHWA Traffic Noise Model (TNM) was released on March 30, 1998. This marked the end of more than 6 years of research to develop a new model to incorporate over 2 decades of improvements in the state of the art of predicting highway traffic noise, as well as continuing advancements in computer technology. The TNM bases its calculations on totally new acoustical prediction algorithms, as well as newly measured vehicle emission levels for automobiles, medium trucks, heavy-duty trucks, buses, and motorcycles. Early validation of the TNM has shown an improvement in prediction accuracy.

This technical assistance tool is directly useful to State and local planners and analysts who are continually struggling to address the noise impacts of transportation projects, particularly in rapidly growing urban and suburban areas served by major highways. The TNM aids in providing a better understanding of noise issues associated with the design of new or reconstructed transportation facilities. This understanding helps the FHWA encourage State and local governments to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized.

Numerous publications have also been developed by the FHWA to communicate needed information, best practices, innovative techniques, and other technical assistance to transportation professionals. The products of the ERP have been well received and recognized by State and MPO staffs as valuable tools to use in the planning and project development processes.

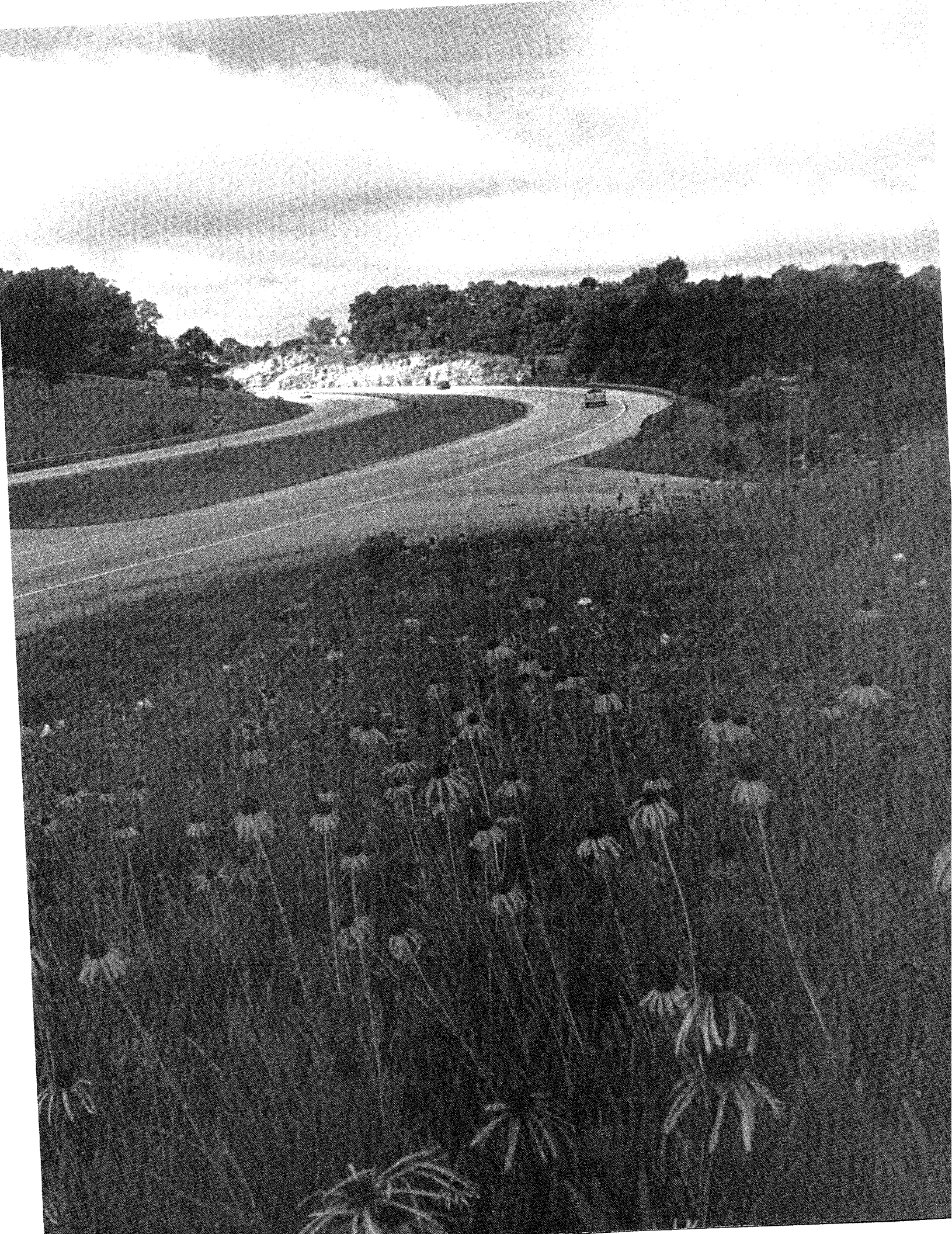
• *Awards and Special Recognition*

• *Environmental Excellence Awards*

In 1995, the FHWA launched this biennial awards program to officially honor partners, projects, and processes that excel in protecting and enhancing the environment while at the same time meet a growing transportation demand. Every 2 years, these awards recognize winning entries from individuals and groups that have broken new ground, created new partnerships, increased public involvement, and enhanced environmental and archaeological sensitivity. The competition for these awards is intense, with fewer than 20 recipients selected every 2 years from dozens of applicants throughout the country. The FHWA is encouraged by the excellence of the candidate projects and looks forward to continuing this important program to reward achievement in the pursuit of environmental excellence.

• *Conclusion*

This report has provided an overview of the Environmental Research Program and examples of completed research efforts that address the human environment, the natural environment, and integrated decisionmaking. We encourage readers to take a look at the Appendix to this report, which contains a full listing of research projects that were completed during the 1990s or are ongoing. As we enter the 21st century, the FHWA will continue to promote, encourage, and conduct environmental research that helps State and local implementing agencies plan for and fund environmentally sound transportation projects. By working closely with our stakeholders, we are encouraged that the progress made in the 1990s can, and will, continue into the next decade.



Appendix — Environmental Research Projects

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NOTE on Organization of Appendix:

The Appendix contains a database of all of the ongoing and completed research projects that have been supported by the Environmental Research Program. The projects are listed alphabetically by title, under the Focus Area and Program Area headings, as described in the Accomplishments Report (page two). A new heading, Environment — General, was added to cover projects of a more general nature than those in the Focus Areas.

ENVIRONMENT — GENERAL

ONGOING RESEARCH:

Environmental Excellence Awards

Performer(s): FHWA

Sponsor(s): FHWA

To order:

Patricia Cazenias. U.S. DOT, FHWA, HEPN-30, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-4085; Fax: 202-366-3409; E-mail: Patricia.cazenias@fhwa.dot.gov;
Order Nos.: FHWA-EP-00-007 (Entry Form); FHWA-EP-99-012 (Calendar) and
FHWA-EP-99-016 (Brochure); FHWA-PD-98-012 (Entry); FHWA-PD-97-039 (Brochure);
FHWA-PD-96-015 (Entry); FHWA-PD-95-024 (Brochure).

Abstract

This ongoing biennial awards program was developed in 1995 by the FHWA to honor those partners, projects, and processes that excel in meeting growing transportation demands while protecting and enhancing the environment. Anyone may nominate a project, process, person, or group that has used FHWA funding sources to make an outstanding contribution to transportation and the environment. Some of the categories have included wetlands, air quality, scenic byways, community livability, and transportation enhancements on Federal-aid highways and highway-related facilities. A call for entry is announced the year prior to the selection of winners, with an August 15 deadline. An independent panel of judges from varying backgrounds selects the winning entries, which are announced at the Earth Day ceremony in Washington, DC. Available are a videotape of the awards ceremony, as well as a brochure and calendar, showcasing the winners. The entry deadline for the year 2001 awards is August 15, 2000.

Transportation Environmental Research Program (TERP)

Performer(s): FHWA

Sponsor(s): FHWA

To order:

Mike Koontz. U.S. DOT, FHWA, RC, 10 S. Howard St., Suite 4000, Baltimore, MD 21201;
Tel: 410-962-2362; Fax: 410-962-3655; Email: Michael.koontz@fhwa.dot.gov;
URL: <http://www.fhwa.dot.gov/terp>.

Abstract

Under the Transportation Environmental Research Program (TERP), six university research projects underway in FY 1998 include: 1) Watershed Modeling of Gasoline Oxygenates Used in Transportation; 2) Dynamic Systems Models for Assessing Environmental Impacts; 3) Remote Sensing Detection of Diesel Electric Locomotive Emissions; 4) Alternative Method for Estimating Noise Barrier Insertion Loss; 5) Highway Monitoring and Surveillance Data in Transportation Planning and ITS Applications; and 6) Wetlands Education for Transportation Development: Mitigating Environmental Impact. These projects will be continued indefinitely.

COMPLETED RESEARCH:

*Development of the Transportation Environmental Research Program (TERP)
(Completed 1997)*

Performer(s): FHWA

Sponsor(s): FHWA

To order:

Mike Koontz. U.S. DOT, FHWA, RC, 10 S. Howard St., Suite 4000, Baltimore, MD 21201;
Tel: 410-962-2362; Fax: 410-962-3655; Email: Michael.koontz@fhwa.dot.gov;
URL: <http://www.fhwa.dot.gov/terp>.

Abstract

The Transportation Environmental Research Program (TERP) began in 1997 by the FHWA to provide start-up funding for university research in environmental areas such as air quality, wetlands, climate change, environmental justice, community impact assessment, historic and archaeological preservation, and many other transportation-related areas. TERP funding grants are slated in the range of \$20,000 to \$50,000, and work plans span from 6 months to 2 years. Several TERP grants have already been awarded by FHWA for the purpose of university research. The brochure summarizes the TERP goals and how to apply for grants.

*Environmental Research—Linking Transportation, the Environment, and the
Future (Completed 1998)*

Performer(s): FHWA

Sponsor(s): FHWA

To order:

Ginny Finch. U.S. DOT, FHWA, HEPN-1, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-4258; Fax: 202-366-3409; Email: Ginny.finch@fhwa.dot.gov;
Order Nos.: FHWA-PD-98-017; HEP-40/7-98(15M)EW.

Abstract

The brochure highlights 14 exemplary FHWA and State Departments of Transportation (DOTs) projects across America that are meeting the environmental research challenge and looks at transportation as the provider of pathways to opportunities which strengthen our communities, our quality of life, and our responsibility for sharing the planet. The FHWA's Environmental Research Program and the States' Surface and Planning Research program allows transportation decisionmakers to define and shape the research agenda and focus on research that will be immediately useful.

Natural Environment

Environmental Research Needs in Transportation—Conference (1991) (Completed 1992)

Performer(s): Transportation Research Board (TRB)

Sponsor(s): FHWA

For more information:

Allen Penn. Transportation Research Board, 2101 Constitution Ave., NW., Washington, DC 20418;
Tel: 202-334-3213; Fax: 202-334-2519;
URL: www.nationalacademies.org/trb/bookstore.

Abstract

Reports the proceedings and findings of a national conference held in 1991 to formulate a highway and transportation-related program of needed environmental research. Prioritized research problem statements covering the full range of environmental topic areas are included. TRB Circular 389.

Environmental Research Needs in Transportation—Conference (1996) (Completed 1997)

Performer(s): Transportation Research Board (TRB)

Sponsor(s): FHWA; Center for Transportation and the Environment (CTE), N.C. State University; TRB

To order:

Allen Penn. Transportation Research Board, 2101 Constitution Ave., NW., Washington, DC 20418;
Tel: 202-334-3213; Fax: 202-334-2519;
URL: Full text available online at: http://itre.ncsu.edu/A1F02/toc_envneeds.html;
Print version can be ordered at <http://www.nationalacademies.org/trb/bookstore/>.
Order No.: TRB Circular 469.

Abstract

This effort was in support of a national research conference to identify transportation environmental research needs, as a guide to research agencies and programs. The conference proceedings, final report research work statements, and anticipated budgets for the identified needs in 13 topic areas were published in TRB Circular Number 469.

Historically Black College and University (HBCU) Project with South Carolina State University — Environment Curriculum Development (Completed 1996)

Performer(s): South Carolina State University

Sponsor(s): FHWA; FHWA SC Div. Office; South Carolina Dept. of Transportation (SCDOT)

To order:

Barbara Beagles, South Carolina Dept. of Transportation, P.O. Box 191, Columbia, SC 29202-0191.
Tel: 803-737-6361; Fax: 803-737-2038; Email: Beaglebd@dot.state.sc.us.

Abstract

The environmental curriculum study involved the feasibility of initiating a bachelor's degree program in environmental transportation studies. It involved surveys of high school students and environmental firms to determine their needs. Also, about 150 universities across the country provided data on their environmental studies curricula. The final report for this effort is entitled "Development of a Model for a Bachelor of Science Program in Environmental Studies." The university curricula data collected for this effort have been put in a user-friendly database.

Natural Environment

Transportation and Global Climate Change: A Review and Analysis of the Literature

Performer(s): FHWA

Sponsor(s): FHWA

To order:

National Technical Information Service (NTIS), 5285 Port Royal Rd., Springfield, VA 22161.
Tel: 1-800-553-6847; Fax: 703-605-6900; Email: Orders@ntis.fedworld.gov;
Order Nos.: DOT-T9703, NTIS No. PB99129132.

For more information:

Michael Savonis. U.S. DOT, FHWA, HEPN-10; 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-2080; Fax: 202-366-3409; Email: Michael.savonis@fhwa.dot.gov.

Abstract

This preliminary assessment of peer-reviewed literature summarizes key findings of the Intergovernmental Panel on Climate Change (IPCC) and the potential implications of global climate change on transportation. Emissions inventories (by mobile source category) of greenhouse gases, possible mitigation strategies related to surface transportation, and the potential health implications of global climate change are presented. The literature review also discusses the latest U.S. global climate change policy efforts to date between 1988 at the first Earth Summit meeting leading up to the signing of the Kyoto Protocol in December 1997. The Appendix provides Internet web sites for obtaining relevant global climate change information, reports, and research.

COMPLETED RESEARCH:

Air Quality Case Studies Report (Completed 1994)

Performer(s): Volpe National Transportation Systems Center

Sponsor(s):

To order:

Adrica Coates. U.S. DOT, FHWA, HEPN-1, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-6724; Fax: 202-366-3409; Email: Adrica.coates@fhwa.dot.gov;
Order Nos.: FHWA-PD-95-034; DOT-VNTSC-FHWA-9422; NTIS No. PB96112792.

Abstract

This report examines the response by metropolitan areas to the 1990 Clean Air Act Amendments (CAAAAs) and the 1991 ISTEA as they relate to the process for establishing conformity of transportation improvement programs and plans. Cases studied in this report include the processes employed by Denver, Raleigh-Durham, Philadelphia, and Washington nonattainment areas and their focus on travel demand and air quality modeling. Also covered is information on demographic and economic issues and the estimated cost for determining conformity.

A Behavioral Analysis of EPA's MOBILE Emission Factor Model (Completed 1998)

Performer(s): Resources for the Future

Sponsor(s): FHWA

To order:

Adrica Coates. U.S. DOT, FHWA, HEPN-1, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-2204; Fax: 202-366-3409; Email: Adrica.coates@fhwa.dot.gov;
Order Nos.: FHWA-PD-98-043; NTIS No. PB99119612.

Abstract

This report provides a review and assessment of several important aspects of U.S. Environmental Protection Agency's MOBILE emissions factor model, which is used for estimating emissions factors for mobile source inventories. Inventory models like MOBILE have many uses, but the focus of this research is on possible improvements for input data used in quantifying emissions related to certain inspection and maintenance programs. The report assesses the MOBILE model's strengths and weaknesses toward accounting for driver behavior in relation to inspection and maintenance programs, and how future improvements to the MOBILE emissions factor model may assist toward improving future estimates of program effectiveness for policy and decisionmaking purposes.

Bibliography of Fuel Consumption Models as a Factor of Speed or Acceleration (Completed 1997)

Performer(s): Center for Transportation and the Environment (CTE) at N.C. State University

Sponsor(s): FHWA

To order:

Lois J. Widmer. N.C. State University, CTE, Information Services Dept., Campus Box 8601, Raleigh, NC 27695-8601;
Tel: 919-515-8581; Fax: 919-515-8898; Email: lwidmer@unity.ncsu.edu.
Order Nos: FHWA-PD-97-45; HEP-4015-97(20M)E.

Abstract

The Center for Transportation and the Environment (CTE) performed a literature review for FHWA on fuel consumption models as a factor of speed or acceleration. Nearly 50 research papers, conference proceedings, and articles are summarized for the years 1985 - 1996. The CTE used five databases for purposes of searching relevant topics covered under this subject.

Natural Environment

Congestion Mitigation and Air Quality Improvement Program—Indirect Benefits (Completed 1996)

Performer(s): Louis Berger and Assoc., Inc.

Sponsor(s): FHWA

To order:

Daniel Wheeler. U.S. DOT, FHWA, HEPN-10; 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-6724; Fax: 202-366-3409; Email: Daniel.wheeler@fhwa.dot.gov;
Order Nos.: FHWA-PD-97-045; HEP-40/5-97(20M)E.

Abstract

The purpose of this research was to better understand and document the indirect benefits that could be attributed to the Congestion Mitigation and Air Quality Improvement (CMAQ) Program. An extensive search effort was launched to seek information and evidence of CMAQ's benefits and to detail the indirect benefits that Metropolitan Planning Organizations (MPOs) and other stakeholders have experienced from the CMAQ program; how CMAQ affected strategic planning processes; examples of specific projects; and quantification of benefits.

Congestion Mitigation and Air Quality Improvement Program Review (Completed 1997)

Performer(s): FHWA, Office of Environment and Planning

Sponsor(s): FHWA; Research and Special Programs Admin. (RSPA), U.S. DOT

To order:

Noreen Bowles. U.S. DOT, FHWA, HEPN-1, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-9173; Fax: 202-366-3409; Email: Noreen.bowles@fhwa.dot.gov;
Order Nos.: DOT-T-97-14; NTIS No. PB97165559.

Abstract

Summary of a national review of the Congestion Mitigation and Air Quality Improvement (CMAQ) Program performed by the FHWA and the Federal Transit Administration (FTA) that was begun in May 1994. The findings of the report suggest that metropolitan areas are beginning to realize the full potential of the CMAQ program and are improving obligation rates as a result of increased familiarity with the program. Enhanced coordination mechanisms and technical tools have facilitated the programming of CMAQ funds. State and local officials have found the CMAQ program to be very flexible, with nearly half of the funding made available for transit improvements. The program review also found that State and local planners are attempting to restructure their planning processes to allow for greater decentralization and increased public participation.

Natural Environment

Cost Effectiveness of Transportation Control Measures by CMAQ Category (Completed 1997)

Performer(s): Center for Transportation and the Environment (CTE) at N.C. State University
Sponsor(s): FHWA

To order:

Lois J. Widmer. CTE, Information Services Dept., Campus Box 8601, Raleigh, NC 27695-8601;
Tel: 919-515-8581; Fax: 919-515-8898; Email: lwidmer@unity.ncsu.edu;
URL: Abbreviated version available online at <http://itre.ncsu.edu/cte>.

Abstract

A literature review that covers a wide range of sources that summarize emissions benefits and the cost-effectiveness of transportation control measures (TCMs) identified within the 1990 Clean Air Act Amendments and funded under the U.S. DOT's Congestion Mitigation and Air Quality Improvement (CMAQ) Program. The review focused on identifying projects that have already been proposed or implemented.

Costs and Effectiveness of Transportation Control Measures (TCMs): A Review and Analysis of the Literature (Completed 1994)

Performer(s): Apogee Research, Inc.
Sponsor(s): FHWA

For more information:

Daniel Wheeler. U.S. DOT, FHWA, HEPN-10, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-2204; Fax: 202-366-3409; Email: Daniel.wheeler@fhwa.dot.gov.

Abstract

The 1990 Clean Air Act Amendments (CAAAAs) and ISTEA (1991) require the use of Transportation Control Measures (TCMs) for the purpose of conforming to State Implementation Plans (SIPs) and achieving the National Ambient Air Quality Standards (NAAQS). This document provides an overview of some real-life experiences with TCM implementation and the potential of TCMs to reduce the emissions from mobile sources. The emission reduction potential of TCMs is divided into strong, weak, and speculative scenarios for the purposes of this study. The report analyzes TCMs only in context of their effectiveness and cost-effectiveness with regard to reduction of emissions and is intended to provide valuable information on the clean air effects of a variety of transportation measures.

Data Aggregation Issues in the Application of the MOBILE Emissions Model (Completed 1994)

Performer(s): Cambridge Systematics, Inc.
Sponsor(s): FHWA

To order:

Adrica Coates. FHWA, HEPN-1, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-6724; Fax: 202-366-3409; Email: Adrica.coates@fhwa.dot.gov;
Order Nos.: FHWA-PD-95-033; DOT-VNTSC-FHWA-94-20; NTIS No. PB96112750.

Abstract

This report discusses several technical issues relating to spatial and temporal data aggregation and collection and its use in emission estimation. Topics such as whether vehicle emissions should be calculated on a link, corridor, or other basis and whether emissions should be estimated on an hourly, peak period, or daily basis, are discussed. The effects resulting from the use of one method versus another are outlined. Other factors contributing to these issues are also examined.

DOT/EPA Transportation and Air Quality Public Information Initiative: Pilot Tests and National Coalition Development [FHWA ERP Report Title: Air Quality Public Outreach/Education] (Completed Oct. 1998)

Performer(s): Equals Three Communications

Sponsor(s): FHWA

To order:

Kathy Daniel. FHWA, HEPN-10; 400 Seventh Street, SW., Washington, DC 20590;
Tel: 202-366-6276; Fax: 202-366-3409; Email: Kathy.daniel@fhwa.dot.gov.
<http://www.epa.gov/otaq/traq/traqpedo/italladd>.

Abstract

In response to requests from State and local government officials, the U.S. DOT and the U.S. Environmental Protection Agency (U.S. EPA) are collaborating on a public information initiative aimed at enhancing public involvement in voluntary behavior changes that reduce congestion and improve air quality, which are goals under the Transportation Equity Act for the 21st Century and the Clean Air Act. One of the main focuses of the project is to build national and local coalitions of public and private organizations geared toward changing attitudes and behaviors related to transportation and air quality. The initiative seeks to improve current programs and develop a community-based effort by bringing private-sector resources to support public outreach efforts. The four components of the initiative are: pilot tests, coalition building, outreach, and evaluation of the program. Creative materials were tested in three pilot cities: Dover, Delaware; Milwaukee, Wisconsin; and San Francisco, California. These materials included radio, TV, and print advertisements, which encouraged people to maintain their cars in good condition, link their automobile trips, and use alternative modes of transportation. In addition, pilot sites were given technical assistance and limited funding for local public outreach initiatives. The summary report, which was released February 24, 1999, describes the lessons learned and evaluates the results of pre- and post-campaign telephone surveys conducted in each city. Fourteen cities were chosen to be demonstration communities based on a number of criteria, including their ability to support transportation choices that lead to congestion mitigation and improved air quality over the long term. The U.S. DOT and the U.S. EPA facilitated the formation of the "Alliance for Clean Air and Transportation" to unite private and public organizations to carry on these same goals.

Effects of Mobile Source Emissions on Health and Property (Completed 1997)

Performer(s): Center for Transportation and the Environment (CTE) at N.C. State University

Sponsor(s): FHWA

To order:

Lois J. Widmer. CTE, Information Services Dept., Campus Box 8601, Raleigh, NC 27695-8601;
Tel: 919-515-8581; Fax: 919-515-8898; Email: lwidmer@unity.ncsu.edu.

Abstract

The Center for Transportation and the Environment (CTE) performed a literature review on the effects of mobile source emissions on health and property. The review provides nearly 80 resources on the impacts on health, occupational health, and property impacts. The CTE found that literature related to impacts to property from mobile source emissions was extremely limited.

Natural Environment

***Estimating Emissions Reductions from Vehicle Retirement Programs
(Completed 1997)***

Performer(s): Volpe National Transportation Systems Center

Sponsor(s): FHWA

To order:

Kevin N. Black. FHWA, HEPN-10, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-9485; Fax: 202-366-3409; Email: Kevin.n.black@fhwa.dot.gov;
Order Nos.: FHWA-PD-97-011; DOT-VNTSC-FHWA-97-4; NTIS No. PB97153795.

Abstract

The final report assesses the effectiveness of vehicle retirement programs in reducing transportation emissions. The impact of eliminating cars and light trucks more than 20 years old was analyzed using the U.S. Environmental Protection Agency's MOBILE 5a emission model. An emission reduction potential of less than 5 percent was identified. While this reduction is large compared to most transportation control strategies, it is small compared to other actions such as inspection and maintenance or the use of reformulated fuels. Significant variations in results occur if local rather than national default age and use data are used. Finally, the emission rates from older vehicles used in the Mobil model appear to be understated in the Mobil Model when compared to other studies of older vehicles.

Evaluation of the MOBILE Vehicle Emission Model (Completed 1994)

Performer(s): Sierra Research, Inc.

Sponsor(s): FHWA

To order:

Adrica Coates. FHWA, HEPN-1, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-6724; Fax: 202-366-3409; Email: Adrica.coates@fhwa.dot.gov;
Order Nos.: FHWA-PD-94-038; DOT-VNTSC-FHWA-94-8; NTIS No. PB95170239.

Abstract

The U.S. Environmental Protection Agency's MOBILE5 model is used to estimate emissions from on-road motor vehicles. MOBILE5 represents the fifth version of this program, which has undergone continuous revision in attempts to estimate mobile source emission trends since its development in the late 1970s. Modifications have been made to the MOBILE model structure in attempts to account for technical and policy changes including Inspection and Maintenance (I&M) programs, reformulated gasoline and oxyfuel programs, and other initiatives. Comparisons are made between the assumptions used in MOBILE5, MOBILE4.1, MOBILE 4, and emission rate projections.

Natural Environment

Induced Demand: Traffic Diversion vs. Generation and Related Issues (Completed 1996)

Performer(s): Center for Transportation and the Environment (CTE) at N.C. State University
Sponsor(s): FHWA

To order:

Lois J. Widmer. CTE, Information Services Dept., Campus Box 8601, Raleigh, NC 27695-8601;
Tel: 919-515-8581; Fax: 919-515-8898; Email: lwidmer@unity.ncsu.edu.

Abstract

The Center for Transportation and the Environment (CTE) performed a literature review on induced travel demand in September 1996. Abstracts from approximately 50 research articles from the United States and abroad are included in this report. Special Report 245 "Expanding Metropolitan Highways: Implications for Air Quality and Energy Use" published by the Transportation Research Board in 1995, is also cited as an important resource document.

Innovations in Transportation and Air Quality—Twelve Exemplary Projects (Completed 1996)

Performer(s): Federal Transit Admin. (FTA)
Sponsor(s): FHWA

To order:

Adrica Coates. FHWA, HEPN-1, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-6724; Fax: 202-366-3409; Email: Adrica.coates@fhwa.dot.gov;
Order Nos.: FHWA-PD-96-016; NTIS No. PB96183280.

Abstract

The booklet describes 12 exemplary projects funded under the Congestion Mitigation and Air Quality Improvement (CMAQ) Program through its "flexible funding" program of transferring a greater percentage of funds to transit improvements. These projects were showcased to stimulate further innovation and creativity in addressing air quality problems through transportation measures. A diverse group of projects are described, ranging from intermodal connections to freight and goods movement to parking management and pedestrian access. While the projects deal with different transportation issues, they all yield air quality and other benefits, such as congestion relief, economic development, energy conservation, etc. Contact persons are listed for further information in the highlighted projects.

Intelligent Transportation Systems Impact on the Environment (Completed 1997)

Performer(s): Center for Transportation and the Environment (CTE), N.C. State University
Sponsor(s): FHWA

To order:

Lois J. Widmer. CTE, Information Services Dept., Campus Box 8601, Raleigh, NC 27695-8601;
Tel: 919-515-8581; Fax: 919-515-8898; Email: lwidmer@unity.ncsu.edu.

Abstract

The Center for Transportation and the Environment performed a literature review for FHWA on intelligent transportation systems (ITS) and their impact on the environment. Approximately 50 journal articles are summarized in the form of abstracts. Two articles include discussion of the ITS-related services that were used during the Olympic Games in Atlanta, GA, in 1996. Most of the assessments related to ITS impacts on reductions of criteria pollutants were found to be very preliminary, as the current state of practice for modeling is not sufficient to quantitatively assess the effects of traffic flow smoothing, a common effect among ITS technologies.

Natural Environment

Interagency Consultation: The Key Toward Collaborative State and Local Decisionmaking in the Conformity Process (Completed 1997)

Performer(s): FHWA

Sponsor(s): FHWA; Research and Sponsored Programs Admin. (RSPA), U.S. DOT

To order:

Noreen Bowles. FHWA, HEPN-1, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-9173; Fax: 202-366-3409; Email: Noreen.bowles@fhwa.dot.gov;
Order Nos.: DOT-T-97-11; NTIS No. PB97158083.

Abstract

Based on a review of interagency consultation processes from across the Nation, the FHWA has compiled successful examples of State and local agencies and their efforts to improve the transportation conformity process. A total of 34 States have been included in this review, and successful examples are outlined in table format within the report. Findings of this report suggest that interagency consultation, if performed early in the metropolitan planning process, may assist State and local decisionmaking at the regional level. The establishment of emissions budgets through the Statewide Implementation Plan (SIP) process needs to include the transportation sector to ensure that future conformity issues are not raised at the last minute during metropolitan planning and transportation improvement program development and updates.

Literature Review on Vehicle Emissions Models (Completed 1997)

Performer(s): Center for Transportation and the Environment (CTE), N.C. State University

Sponsor(s): FHWA

To order:

Lois J. Widmer. CTE, Information Services Dept., Campus Box 8601, Raleigh, NC 27695-8601;
Tel: 919-515-8581; Fax: 919-515-8898; Email: lwidmer@unity.ncsu.edu.

Abstract

The Center for Transportation and the Environment (CTE) performed a literature review on vehicle emissions models. The review covers both United States and international research on this topic, with a total of 40 abstracts, including journal articles and summary proceedings from 1987 to 1997. Computer model evaluations and on-board emission diagnostic tests performed by researchers are also presented.

Natural Environment

A Manual of Regional Transportation Modeling Practice for Air Quality Analysis (Version 1.0) (Completed 1993)

Performer(s): National Association of Regional Councils (NARC)

Sponsor(s): NARC

To order:

Sylvia Bryant. National Assoc. of Regional Councils, 1700 K St., NW., Suite 1300, Washington, DC 20006;

Tel: 202-457-0710, ext 18; Fax: 202-296-9352; Email: sylvia@narc.org.

Abstract

The manual was developed under the auspices of the Clean Air Project of the National Association of Regional Councils (NARC). A conference was held in Crystal City, Virginia, in November 1991, and nearly 100 regional, State, and Federal transportation planning officials attended. This conference provided the opportunity for participants to set the direction for the development of the manual. The manual was developed for the purpose of providing guidance on CAA issues to consider in responding to new regional analysis needs, and especially for carrying out transportation modeling for air quality planning efforts. The manual reviews the current state of practice today and focuses primarily on travel demand forecasting as it is practiced by regional agencies and MPOs. It identifies and discusses modeling and analysis requirements resulting from the CAA and ISTEA, and suggests strategies for responding to specific analysis needs and for overcoming common problems. Further research needs are identified within the manual for purposes of research and development.

The MOBILE Model and Transportation Planning: A Brief Overview (Completed 1995)

Performer(s): Volpe National Transportation Systems Center

Sponsor(s): FHWA

To order:

Kevin N. Black. FHWA, HEPN-10, 400 Seventh St., SW., Washington, DC 20590;

Tel: 202-366-9485; Fax: 202-366-3409; Email: Kevin.n.black@fhwa.dot.gov;

Order Nos.: FHWA-PD-95; DOT-VNTSC-FHWA-95-7; NTIS No. PB96144233.

Abstract

This is a simplified summary of the MOBILE model and description of how it is used in transportation planning. The booklet was developed for distribution to nontechnical audiences that work with the transportation field and use the results of the MOBILE model.

Natural Environment

The New Politics of Clean Air and Transportation (Completed 1997)

Performer(s): Volpe National Transportation Systems Center

Sponsor(s): FHWA

To order:

Kevin N. Black. FHWA, HEPN-10, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-9485; Fax: 202-366-3409; Email: Kevin.n.black@fhwa.dot.gov;
Order Nos.: FHWA-PD-97-010; DOT-VNTSC-FHWA-97-5; NTIS No. PB97153803.

Abstract

This report documents research performed by the John F. Kennedy School of Government to describe the early experiences at the State and local levels in implementing the transportation provisions of the 1990 Clean Air Act Amendments (CAAAAs) and the air quality provisions of the ISTEA of 1991. Some issues addressed in this document include: the organizational capacity for implementing Federal clean air mandates, creating State and regional policymaking arenas to assess and choose options, the air quality impact of transportation actions taken, and obtaining public consent for the adopted policies.

An Overview of the PM-10 Base Year Emissions Inventories (Completed 1997)

Performer(s): Volpe National Transportation Systems Center

Sponsor(s): FHWA

To order:

Kevin N. Black. FHWA, HEPN-10, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-9485; Fax: 202-366-3409; Email: Kevin.n.black@fhwa.dot.gov;
Order Nos.: FHWA-PD-98-002; DOT-VNTSC-FHWA-97-3; NTIS No. PB98128820.

Abstract

The report discusses requirements for the content of PM-10 State Implementation Plans (SIPs). It includes information from the U.S. Environmental Protection Agency's PM-10 guidance document and the contents of several 1990 Base Year PM-10 SIPs from cities throughout the country. In addition, topics covering emission estimation methods, PM-10 modeling, and PM-10 control measures are described.

Ozone Trends in Severe and Serious Non-Attainment Areas (Completed 1994)

Performer(s): Volpe National Transportation Systems Center

Sponsor(s): FHWA

To order:

Adrica Coates. FHWA, HEPN-1, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-6724; Fax: 202-366-3409; Email: Adrica.coates@fhwa.dot.gov;
Order Nos.: FHWA-PD-96-4.

Abstract

This report examines the ozone emission trends in 20 areas classified by the U.S. Environmental Protection Agency as either serious or severe for nonattainment of the ozone standard over the years 1980-1993. Trends were evaluated to determine their statistical significance and to compare the magnitude and direction of the trends on an urban, regional, and national basis. In performing the analysis, several factors were considered, including meteorology, geographic variations, and effects of economic growth.

Natural Environment

Qualitative Assessment of IVHS Emission and Air Quality Impacts (Completed 1993)

Performer(s): Jack Faucett Assoc.

Sponsor(s): FHWA

To order:

Adrica Coates. FHWA, HEPN-1, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-6724; Fax: 202-366-3409; Email: Adrica.coates@fhwa.dot.gov;
Order Nos.: FHWA-PD-93-4.

Abstract

This report describes Intelligent Vehicle Highway System (IVHS) program contributions to air quality. It outlines the current debate on the role of IVHS in reducing congestion in light of the argument that increasing capacity will induce more travel and offset any gains made in reducing traffic congestion and emissions. The report also discusses strategies designed to reduce emissions by encouraging mode shifts and plans designed to reduce pollution, such as inspection and maintenance (I&M) programs.

Review of Procedures for Estimating On-Road Mobile Source Emissions Inventories for 1990 Base Year SIPs (Completed 1997)

Performer(s): Volpe National Transportation Systems Center

Sponsor(s): FHWA

To order:

Kevin N. Black. FHWA, HEPN-10, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-9485; Fax: 202-366-3409; Email: Kevin.n.black@fhwa.dot.gov;
Order Nos.: FHWA-PD-98-003; DOT-VNTSC-FHWA-97-2; NTIS No. PB98128838.

Abstract

This report supports the implementation of the 1990 Clean Air Act Amendments (CAAAAs) by providing information for preparing the On-Road Mobile Source section of emission inventories. It examines the current practices used by State environmental and transportation agencies, regional transportation committees, and metropolitan planning organizations in developing on-road mobile emission inventories for 33 nonattainment areas. Some innovative practices are also reviewed.

The Role of Motor Vehicle Emission Controls in State Implementation Plans (Completed 1997)

Performer(s): Volpe National Transportation Systems Center

Sponsor(s): FHWA

To order:

Kevin N. Black. FHWA, HEPN-10, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-9485; Fax: 202-366-3409; Email: Kevin.n.black@fhwa.dot.gov;
Order Nos.: FHWA-PD-98-001; DOT-VNTSC-FHWA-97-7; NTIS No. PB98128812.

Abstract

This report examines the ozone emission trends in 20 areas classified by the U.S. Environmental Protection Agency as either serious or severe for nonattainment of the ozone standard over the years 1980-1993. Trends were evaluated to determine their statistical significance and to compare the magnitude and direction of the trends on an urban, regional, and national basis. In performing the analysis, several factors were considered, including meteorology, geographic variations, and effects of economic growth.

Natural Environment

A Sensitivity Evaluation of CAL3QHC Dispersion Model for Carbon Monoxide Analysis at Urban Intersections (Completed 1994)

Performer(s): FHWA

Sponsor(s): FHWA

To order:

Adrica Coates. FHWA , HEPN-1, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-6724; Fax: 202-366-3409; Email: Adrica.coates@fhwa.dot.gov.

Abstract

This paper was developed to evaluate the implications of U.S. Environmental Protection Agency's proposed improvements to the current CAL3QHC model used to determine emission concentrations at intersections. It evaluates several variables used in the program by performing statistical analyses to define the variables having the strongest correlations in influencing the emission concentrations at intersections.

Strategic Analysis of Regional Air Quality Options (Phase I) (Completed 1997)

Performer(s): Apogee Research, Inc./Hagler Bailly Services, Inc.

Sponsor(s): FHWA

To order:

Adrica Coates. FHWA , HEPN-1, 400 Seventh St., SW, Washington, DC 20590;
Tel: 202-366-6724; Fax: 202-366-3409; Email: Adrica.coates@fhwa.dot.gov.

For more information:

Mike Koontz. FHWA, RC, 10 S. Howard St., Suite 4000, Baltimore, MD 21201;
Tel: 410-962-2362; Fax: 41 962-3655; Email: Michael.koontz@fhwa.dot.gov.

Abstract

Phase I of this research effort is geared toward analysis of national air quality trends within selected metropolitan planning areas. Emphasis is placed on ozone, the spational variability in the formation of ozone pollution, and correlation of trends and projections with programs and implementation of technologies required under the 1990 Clean Air Act Amendments (CAAAAs). Phase II is a continuation of this effort.

A Summary: Transportation Programs and Provisions of the Clean Air Act Amendments of 1990 (Completed 1992)

Performer(s): FHWA

Sponsor(s): FHWA

To order:

Adrica Coates. FHWA , HEPN-1, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-6724; Fax: 202-366-3409; Email: Adrica.coates@fhwa.dot.gov;
Order Nos.: FHWA-PD-92-023.

Abstract

This brochure provides an overview of the 1990 Clean Air Act Amendments (CAAAAs) and the planning requirements for State Implementation Plan (SIP) development. It discusses the effects of pollution on human health and how transportation planning assists in advancing the clean air goals of the CAAAs. The foldouts of the pamphlets provide colored tables illustrating the necessary planning requirements by severity and pollutant type. The brochure also attempts to provide definitions of the transportation conformity process and how ISTEA planning relates to the development of SIPs for attainment of the National Ambient Air Quality Standards (NAAQS). A listing of regional air quality specialists is provided in the appendix for additional questions or information.

Natural Environment

Sustaining the Nation's Efforts to Improve Air Quality Through Integrated Transportation and Air Quality Planning (CAP) (Completed 1999)

Performer(s): Harvard University

Sponsor(s): U.S. Environmental Protection Agency (U.S. EPA); U.S. DOT

For more information:

Lucy Garliauskas. FHWA, HEPE-1; 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-2068; Fax: 202-366-3409; Email: Lucy.garliauskas@fhwa.dot.gov.

Abstract

Two parts: 1) Conformity Pilot Program Development: This effort assisted the U.S. EPA and the U.S. DOT in developing the concept and design of a conformity pilot program that gives States and metropolitan planning organizations (MPOs) the opportunity to propose new flexibility in meeting conformity requirements. The U.S. EPA published a *Federal Register* notice (64 FR 13476) announcing the opportunity to propose new flexibility in meeting the conformity requirements (40 CFR 93). No pilot proposals have been submitted to date.

2) Conformity Assessment Project (CAP)/Phase I: A 15-site research project was carried out independently by researchers at Harvard University to analyze the institutional and planning process impacts of the transportation conformity regulations. The study was completed in March 1999. Phase I established baseline information and a historical assessment on how conformity has worked and what effects conformity has had to date on transportation and air quality planning.

Transportation Air Quality: Selected Facts and Figures (Completed 1996)

Performer(s): Apogee Research, Inc.

Sponsor(s): FHWA

To order:

Noreen Bowles. FHWA, HEPN-1, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-9173; Fax: 301-366-3409; Email: Noreen.bowles@fhwa.dot.gov;
Order No.: FHWA-PD-96-006.

Abstract

This brochure shows the latest travel and emissions trends, and nonattainment areas throughout the Nation. Selected facts and figures include tables and summaries of the health impacts of smog and air pollution, total highway emissions and travel trends, and other interesting facts on transportation and air quality. Various policy responses to reducing criteria pollutants from automobiles are explored, including the CMAQ Program, the \$6 billion Congestion Mitigation and Air Quality Improvement Program created under the Intermodal Surface Transportation Equity Act (ISTEA). A revision and update of the brochure was made available in 1999.

Natural Environment

Transportation Air Quality: Selected Facts and Figures (Revision)

(Completed 1999)

Performer(s): Apogee Research, Inc./Hagler Bailly Services, Inc.

Sponsor(s): FHWA

To order:

Adrica Coates. FHWA, HEPN-1, 400 Seventh St., SW., Washington, DC 20590;

Tel: 202-366-6724; Fax: 301-366-3409; Email: Adrica.coates@fhwa.dot.gov;

Order No.: FHWA-PD-99-015.

Abstract

Revision of the original brochure of the same title, originally published by the FHWA in 1996. Contains more recent travel statistics and health research related to criteria pollutants formed from mobile source emissions. Topics for the general audience include emissions trends, automobile tailpipe standards, criteria pollutants, reformulated fuel standards, and nonattainment area status. Information sources are Federal agencies, including the U.S. DOT and the U.S. Environmental Protection Agency.

VMT Growth and Improved Air Quality: How Long Can Progress Continue? (Completed 1997)

Performer(s): Volpe National Transportation Systems Center

Sponsor(s): FHWA

To order:

Kevin N. Black. FHWA, HEPN-10, 400 Seventh St., SW, Washington, DC 20590;

Tel: 202-366-9485; Fax: 202-366-3409; Email: Kevin.n.black@fhwa.dot.gov;

Order No.: FHWA-PD-97-6.

Abstract

The brochure documents the significant improvements in the Nation's air quality that have occurred over the past 20 years and the role of motor vehicles in achieving these improvements. Future motor vehicle emission trends for two cities are then presented, first based on current emission model assumptions and then with the National Low-Emission Vehicle program included. This program is only one of several technological changes being advanced by U.S. Environmental Protection Agency. The analysis shows that technological improvements will likely continue to reduce overall motor vehicle emissions well beyond the 2005 upturn predicted in the current model. Finally, the report documents the declining long-term trend in the national vehicle miles traveled (VMT) growth rate.

Natural Environment

White Paper: Methodology for Assessing the Economic Benefits of Projects Funded Under the CMAQ Improvement Program (Completed 1998)

Performer(s): Louis Berger and Assoc., Inc.

Sponsor(s): FHWA

To order:

Cecilia Ho. FHWA, HEPN-10, 400 Seventh St., SW., Washington, DC 20590;

Tel: 202-366-9862; Fax: 202-366-3409; Email: Cecilia.ho@fhwa.dot.gov.

Abstract

This paper proposes a methodology for assessing the economic benefits of projects funded under the Congestion Mitigation and Air Quality Improvement (CMAQ) Program. The economic benefits described herein explicitly do not include the impacts on air quality attributable to the projects, such as reductions in volatile organic compounds, carbon monoxide (CO), and nitrogen oxides (NO_x) (direct project benefits). Instead, the potential economic benefits are defined as indirect impacts, such as user benefits and land use and development benefits from CMAQ-funded transportation investments. The purpose of this paper is to discuss the potential economic benefits that are most likely to be caused by CMAQ-funded projects. This report draws on a wide variety of sources and practices to establish an evaluation methodology.

NOISE

ONGOING RESEARCH:

Improvement of the FHWA Traffic Noise Model (FHWA TNM)

Performer(s): Volpe National Transportation Systems Center

Sponsor(s): FHWA

For more information:

Bob Armstrong. FHWA, HEPN-20, 400 7th Street, SW., Washington, D.C. 20590;
Tel. 202-366-2073; Fax 202-366-3409; E-mail: Robert.e.armstrong@fhwa.dot.gov.

Abstract

Verification of the FHWA Traffic Noise Model (TNM), released in March 1998, was limited; i.e., it included three comparisons with point source geometry and two comparisons of in-situ measurements of barrier performance along actual highways. This multiyear research study will validate all aspects of the model. The initial phase of validation will include the elements of the model most often used in highway traffic noise analyses; validation of all other elements will follow. Field measurements made to support the model validation will be used to begin study of atmospheric effects on the propagation of highway traffic noise, effects which may be included in the FHWA TNM in the future. This research study will also address problems and inconveniences users have identified subsequent to the release of the FHWA TNM, as well as incorporate improvements in the model's graphical user interface. An interim upgrade of the FHWA TNM should be released in the summer of 2000; a final upgrade should be released during 2002.

Noise Barrier Design Manual and Videotape

Performer(s): Volpe National Transportation Systems Center

Sponsor(s): FHWA

For more information:

Steve Ronning. FHWA, HEPN-20; 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-2078; Fax: 202-366-3409; Email: Steven.ronning@fhwa.dot.gov.

Abstract

This research will develop a manual for noise barrier design. It will be a how-to document on the principles of noise barriers and barrier design that is useful to both the novice and the skilled practitioner. The manual will be complemented by a videotape, which emphasizes the material contained in the manual.

COMPLETED RESEARCH:

*Acoustics and Your Environment—The Basics of Sound and Highway Traffic Noise
(Completed March 1999)*

Performer(s): Volpe National Transportation Systems Center

Sponsor(s): FHWA

To order:

National Technical Information Service (NTIS). 5285 Port Royal Rd., Springfield, VA 22161;
Tel. 1-800-553-6847; Fax. 703-605-6900; Email: Orders@NTIS.fedworld.gov;
Order Nos.: Rept. No. DTS-34-HW966-LR1; NTIS No. AVA20426VNB1.

Abstract

This research will develop a videotape that discusses the principles of sound and highway traffic noise. Information will be presented simply in a nontechnical manner so that the videotape can be used as an educational tool for the general public. It will also be used to train highway traffic noise analysts.

*Development of National Reference Energy Mean Emission Levels for FHWA
Traffic Noise Model, Version 1.0 (Completed 1995)*

Performer(s): Volpe National Transportation Systems Center

Sponsor(s): FHWA R&D Pooled Fund Study

To order:

National Technical Information Service (NTIS). 5285 Port Royal Rd., Springfield, VA 22161;
Tel: 1-800-553-6847; Fax: 703-605-6900; Email: Orders@NTIS.fedworld.gov;
Order Nos.: FHWA-PD-96-008; DOTVNTSCFHWA96-2; NTIS No. PB96147780.

Abstract

During the period July 1993 through November 1995, the Volpe National Transportation Systems Center conducted the National Pooled-Fund Study (NPFS) "Highway Noise Model Data Base Development." This report presents the results of the study, including the measurement, data reduction, and analysis procedures used to develop the database, which is the foundation of the FHWA Traffic Noise Model, Version 1.0.

*Highway Noise Barriers: Performance, Maintenance, and Safety
(Completed 1996)*

Performer(s): Volpe National Transportation Systems Center

Sponsor(s): FHWA

To order:

National Technical Information Service (NTIS). 5285 Port Royal Rd., Springfield, VA 22161;
Tel: 1-800-553-6847; Fax: 703-605-6900; Email: Orders @NTIS.fedworld.gov;
Order No.: NTIS No. AVA19985VNB1.

Abstract

This videotape, approximately 43 minutes in length, is an educational tool that illustrates many different aspects of highway noise barriers. The videotape covers (1) basic acoustics; (2) barrier performance; (3) types of barriers; (4) wall barrier materials; (5) barrier maintenance concerns; and (6) barrier safety concerns.

Natural Environment

Interrupted Flow Reference Energy Mean Emission Levels for the FHWA Traffic Noise Model (Completed 1997)

Performer(s): Vanderbilt University

Sponsor(s): FHWA R&D Pooled Fund Study

To order:

National Technical Information Service (NTIS), 5285 Port Royal Rd., Springfield, VA 22161;
Tel: 703-487-4650; Fax: 703-605-6900; Email: Orders@NTIS.fedworld.gov;
Order Nos.: DOT/FHWA-PD-97-019; DOTVNTSC-FHWA-97-1; NTIS No. PB97138226.

Abstract

During the period July 1993 through November 1995, the Volpe National Transportation Systems Center conducted the National Pooled-Fund Study (NPFS) "Highway Noise Model Data Base Development." This report presents the results of one portion of the study the measurement, data reduction, and analysis of individual vehicle sound level and speed data for interrupted flow traffic (accelerating from stop signs, toll booths, and on-highway ramps). Also presented is the development of regression equations for the resulting Reference Energy Mean Emission Levels (REMELs) as a function of vehicle speed and vehicle type. These REMELs are part of the database upon which the FHWA Traffic Noise Model, Version 1.0, is based.

Measurement of Highway-Related Noise (Completed 1996)

Performer(s): Volpe National Transportation Systems Center

Sponsor(s): FHWA

To order:

National Technical Information Service (NTIS). 5285 Port Royal Rd., Springfield, VA 22161;
Tel: 1-800-553-6847; Fax: 703-605-6900; Email: Orders@NTIS.fedworld.gov;
Order Nos.: FHWA-PD-96-046; DOT-VNTSC-FHWA-96-5; NTIS No. PB97120489.

Abstract

This report reflects substantial improvements and changes in highway-related noise measurement technologies that evolved subsequent to the 1981 publication "Sound Procedures for Measuring Highway Noise." The report documents the recommended procedures for the measurement of (1) existing noise; (2) vehicle noise emissions; (3) barrier insertion loss; (4) construction equipment noise; (5) noise reduction due to buildings; and (6) occupational noise exposure.

Parallel Barrier Effectiveness — Dulles Noise Barrier Project (Completed 1990)

Performer(s): Volpe National Transportation Systems Center

Sponsor(s): FHWA R&D Pooled Fund Study

To order:

National Technical Information Service (NTIS). 5285 Port Royal Rd., Springfield, VA 22161;
Tel: 1-800-553-6847; Fax: 703-605-6900; Email: Orders@NTIS.fedworld.gov;
Order Nos.: FHWA-RD-90-105; DOT-TSC-FHWA-90-1; NTIS No. PB90252388.

Abstract

This report presents the results of testing on experimental parallel noise barriers constructed at a site at Dulles International Airport in Chantilly, Virginia. The study focused on the use of absorptive treatment and tilting as a means of improving the insertion loss of two parallel barriers. It also evaluated the feasibility of modeling a moving point source with an artificial fixed-point source. The report is intended for highway traffic noise analysts. This is the first of three studies. The second is "Parallel Barrier Effectiveness Under Free-Flowing Traffic Conditions." The third is "Performance Evaluation of Experimental Highway Noise Barriers."

Natural Environment

***Parallel Barrier Effectiveness Under Free-Flowing Traffic Conditions
(Completed 1992)***

Performer(s): Volpe National Transportation Systems Center

Sponsor(s): FHWA R&D Pooled Fund Study

To order:

National Technical Information Service (NTIS). 5285 Port Royal Rd., Springfield, VA 22161;
Tel: 1-800-553-6847; Fax: 703-605-6900; Email: Orders@NTIS.fedworld.gov;
Order Nos.: FHWA-RD-92-068; DOT-VNTSC-FHWA-92-1; NTIS No. PB92203850.

Abstract

This report presents the results of a measurement study performed at a highway noise barrier site located along I-495 in Montgomery County, Maryland. The objective of the study was to measure the degradation in acoustic performance of a highway noise barrier due to the close proximity of a parallel barrier on the opposite side of the roadway. The first study is "Parallel Barrier Effectiveness—Dulles Noise Barrier Project" and the third study is "Performance Evaluation of Experimental Highway Noise Barriers."

***Performance Evaluation of Experimental Highway Noise Barriers
(Completed 1994)***

Performer(s): Volpe National Transportation Systems Center

Sponsor(s): FHWA R&D Pooled Fund Study

To order:

National Technical Information Service (NTIS). 5285 Port Royal Rd., Springfield, VA 22161-2296;
Tel: 1-800-553-6847; Fax: 703-605-6900; Email: Orders@NTIS.fedworld.gov;
Order Nos.: FHWA-RD-94-093; DOT-VNTSC-FHWA-94-16; NTIS Nos. PB95216909 & PB94213626.

Abstract

During the period October 1986 through April 1994, the Volpe National Transportation Systems Center conducted the National Pooled-Fund Study (NPFS) "Evaluation of Performance of Experimental Highway Noise Barriers." Two other reports, "Parallel Barrier Effectiveness" and "Parallel Barrier Effectiveness Under Free Flowing Traffic Conditions," support the NPFS. This report is the third, and final, publication supporting the NPFS. It presents the results of additional analyses of previously collected data and summarizes the findings of the multiyear study.

***Traffic Noise Model (FHWA TNM)—Tables for Simple Applications
(Completed 1998)***

Performer(s): Volpe National Transportation Systems Center

Sponsor(s): FHWA

To order:

Robert Armstrong. FHWA, HEPN-20, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-2073; Fax: 202-366-3409; Email: Robert.e.armstrong@fhwa.dot.gov.

Abstract

This research will develop tables that can be used to look up calculated traffic noise levels based on the new-generation FHWA Traffic Noise Model (FHWA TNM). The tables will be made available in both diskette and hardcopy format so that the use of a computer to obtain calculated noise levels is not required. The tables can be used for screening traffic noise analyses and simple applications of the FHWA TNM.

Natural Environment

Traffic Noise Model (FHWA TNM), Version 1.0 (Completed 1998)

Performer(s): Volpe National Transportation Systems Center

Sponsor(s): FHWA

To order:

McTrans Center. University of Florida, 512 Weil Hall, P.O. Box 116585, Gainesville, FL 32611-6585; Tel: 352-392-0378 x242; Fax: 352-392-3224; Email: Debbie@ce.ufl.edu; URL: www.Mctrans.ce.ufl.edu.

Abstract

The FHWA Traffic Noise Model (TNM), Version 1.0, is a new-generation highway traffic noise prediction model. It calculates traffic noise levels using totally new acoustical algorithms, as well as newly-measured emission levels for five standard vehicle types, i.e., automobiles, medium trucks, heavy trucks, buses, and motorcycles. The calculations are based on one-third octave-band analysis and subsource heights for trucks. The package includes the software, a user's guide, a technical manual, and CD-ROM trainer.

COMPLETED RESEARCH:

An Approach for Assessing Wetland Functions Using Hydrogeomorphic Classification, Reference Wetlands, and Functional Indices. Report number WRP-DE-9. (Completed 1995)

Performer(s): U.S. Army Corps of Engineers (COE)

Sponsor(s): Hydrogeomorphic Wetlands Assessment Program, COE ; FHWA

To order:

National Technical Information Service (NTIS). 5285 Port Royal Rd., Springfield, VA 22161;
Tel: 1-800-553-6847; Fax: 703-605-6900; Email: Orders@NTIS.fedworld.gov;
URL: www.NTIS.gov. Full text available online at <http://www.wes.army.mil/el/wetlands/nat-doc.html>; Order Nos.: WRP-DE-9; NTIS No. ADA3071214.

Abstract

A product of the Hydrogeomorphic (HGM) Wetlands Functional Assessment Program, this document provides the procedural framework for applying the HGM methodology to wetlands. It explains the basis and principals behind the HGM method, describes the HGM wetlands classification system, and gives examples of assessment. It is available to State Departments of Transportation. Other products are being developed by the U.S. Army Corps of Engineers and U.S. Environmental Protection Agency with continued FHWA support, such as regional wetland reference models. See also these products: "Regional Procedures and Scientific Models to Assess Functions of Wetlands" and "A Guidebook for Application of Hydrogeomorphic Assessments to Riverine Wetlands" (both are described in this appendix).

Case Histories of Wetland Restoration and Watershed Planning Strategies Related Highway Projects (Completed 1998)

Performer(s): The Wetlands Initiative, Inc., Chicago, IL

Sponsor(s): FHWA

For more information:

Paul Garrett. FHWA, Colorado Div. Office, 555 Zang St., Room 400, Lakewood, CO 80228;
Tel: 303-969-5772 x332; Fax: 303-969-6727; Email: Paul.garrett@fhwa.dot.gov.

Abstract

The research provides examples of flexible mitigation in the watershed planning context for highway projects. Restoration techniques, administrative processes, institutional relationships through which the restorations were accomplished, and written project case histories will be covered in the final report. The research work was completed in 1998. Publication of the report awaits FHWA review.

Natural Environment

Evaluation of Wetland Mitigation Measures (Completed 1992)

Performer(s): Normandeau Assoc., Inc. (New Hampshire)

Sponsor(s): FHWA

To order:

National Technical Information Service (NTIS). 5285 Port Royal Rd., Springfield, VA 22161;
Tel: 1-800-553-6847; Fax: 703-605-6900; Email: Orders@NTIS.fedworld.gov;
Order Nos.: FHWA-RD-90-083; NTIS No. PB92220607.

Abstract

This report analyzes 17 highway wetland mitigation projects in 14 States, comparing them to natural control wetlands to evaluate the effectiveness of the mitigation to perform wetland functions and values. Field biologists used two functional assessment methods in the field to compare mitigation sites and controls. Conclusions and recommendations for mitigation are included. Volume II: Field Data Sheets, contains WET 2.0 and Hollands-Magee data sheets, as well as plant species lists from sites studied.

A Guidebook for Application of Hydrogeomorphic Assessments to Riverine Wetlands. Report Number WRP-DE-11 (Completed 1995)

Performer(s): U.S. Army Corps of Engineers (COE)

Sponsor(s): Hydrogeomorphic (HGM) Wetlands Assessment Program, COE ; FHWA

To order:

National Technical Information Service (NTIS). 5285 Port Royal Rd., Springfield, VA 22161;
Tel: 1-800-553-6847; Fax: 703-605-6900; Email: Orders@NTIS.fedworld.gov;
URL: www.NTIS.gov. Full text available online at
<http://www.wes.army.mil/el/wetlands/natdoc.html>.
Order Nos.: WRP-DE-11; NTIS No. ADA308366.

Abstract

A product of the Hydrogeomorphic (HGM) Wetlands Functional Assessment Program, this document provides the basic outline and guidance for regionalization of functional assessment models applicable to riverine wetlands under the HGM methodology. It explains the basis and principles behind the HGM method, describes the riverine wetland classes, and gives general functional models for different wetland functions performed by riverine wetlands that should be evaluated under the Section 404 Permit Program. Other products are being developed by the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency with continued FHWA support. A related product in this database is "An Approach for Assessing Wetland Functions Using Hydrogeomorphic Classification, Reference Wetlands, and Functional Indices."

WATER QUALITY, HABITAT, AND ECOSYSTEMS

ONGOING RESEARCH:

Development and Application of an Ecological Linkage Zone Model as a Method to Identify Highway Design and Mitigation Opportunities for Wildlife Crossings

Performer(s): University of Montana

Sponsor(s): FHWA

For more information:

Paul Garrett. FHWA, HEPN-30, 555 Zang St., Room 400, Lakewood, CO 80228;
Tel: 303-969-5772 x332; Fax: 303-969-6727; Email: Paul.garrett@fhwa.dot.gov.

Abstract

The research will examine the characteristics, location, and mapping of ecological zones for movement of animal populations to identify highway design and mitigation opportunities for wildlife crossings.

Management of the Discharge and Quality of Highway Runoff in Karst Areas to Control Impacts to Ground Water

Performer(s): P.E. LeMoreaux & Assoc., Inc.

Sponsor(s): FHWA

To order:

Howard Jongedyk. Turner-Fairbank Highway Research Center; 6300 Georgetown Pike, HRDI-9, McLean, VA 22101-2296.

Tel: 202-493-3077; Fax: 202-493-3086; Email: Howard.jongedyk@fhwa.dot.gov.

Abstract

This research will develop practical remedial technology for the improvement of the quality of highway runoff in areas dominated by karst terrain. The study consists of laboratory studies and field applications of pollution control technology.

Watershed Modeling of Gasoline Oxygenates Used in Transportation

Performer(s): University of Colorado, Denver

Sponsor(s): FHWA

For more information:

Paul Garrett. FHWA, HEPN-30, 555 Zang St., Room 400, Lakewood, CO 80228;
Tel: 303-969-5772 x332; Fax: 303-969-6727; Email: Paul.garrett@fhwa.dot.gov.

Abstract

The research will develop an integrated watershed model that links processes that control the transport and fate of oxygenates methyl tertiary butyl ether (MTBE) in the environment.

COMPLETED RESEARCH:

Attention Motorists: The Bats Have Landed on Our Bridge (Completed 1996)

Performer(s): *Public Roads Magazine*

Sponsor(s): FHWA

To order:

Judy Dakin. FHWA/Turner-Fairbank Highway Research Center, 6300 Georgetown Pike, McLean, VA 22101-2296.

Tel: 202-493-3192; Email: judy.dakin@fhwa.dot.gov

Order No.: *Public Roads Magazine* (Winter, vol. 59, no. 3)

URL: Full text available online at www.TFHRC.gov/pubrds/winter96/p96w12.htm.

Abstract

This magazine article written by Paul Garrett (FHWA) tells about the well publicized population of Mexican freetail bats that roost between beams under the Congress Avenue Bridge in Austin, TX. It also discusses aspects of bat ecology, their status as endangered and declining species worldwide, and a program established by the Texas Department of Transportation (TxDOT) to enhance highway structures as bat habitat. The TxDOT is conducting continuous studies on the bridge and its bat population.

Emerging Issues in Transportation and Water Quality (Completed 1996)

Performer(s): Center for Transportation and the Environment (CTE) at N.C. State University

Sponsor(s): FHWA

To order:

Patricia Cazenias. FHWA, HEPN-30, 400 Seventh St., SW., Washington, DC 20590;

Tel: 202-366-4085; Fax: 202-366-3409; Email: Patricia.cazenias@fhwa.dot.gov.

Abstract

This teleconference was targeted at State transportation environmental officials and other transportation and environmental agency employees who are interested in seeing examples of cooperative efforts in the transportation/water quality issues. The conference began with overviews of water quality issues from representatives of the FHWA and the U.S. Environmental Protection Agency. These overviews were followed by two case studies. Representatives from Pennsylvania's transportation and environmental agencies addressed ways in which they worked together to come up with successful strategies for performing bridge maintenance while protecting water quality. Representatives from Oregon's transportation and environmental agencies discussed their attempts to work together to modify the National Pollution Discharge Elimination System (NPDES) permit process to apply on a watershed basis rather than a population basis. The broadcast was held May 23, 1995, from the Center for Transportation and the Environment at North Carolina State University.

Natural Environment

Transportation and Wildlife: Reducing Wildlife Mortality and Improving Wildlife Passageways Across Transportation Corridors (Proceedings of the Florida Department of Transportation/FHWA Transportation-Related Wildlife Mortality Seminar) (Completed 1996)

Performer(s): Forest Service, U.S. Department of Agriculture

Sponsor(s): FHWA

To order:

Paul Garrett. FHWA, Colorado Div. Office, 555 Zang St., Room 400, Lakewood, CO 80228;
Tel: 303-969-5772; Fax: 303-969-6727; Email: Paul.garrett@fhwa.dot.gov;
Order No.: FHWA-PD-96-041.

Abstract

Held April 30 to May 2, 1996, in Orlando, Florida. This project effort was to sponsor the first of three international conferences on the effects of highways on wildlife mortality and habitat function. Support was for the conference and publishing the subsequent proceedings. The proceedings are considered a state-of-the-art reference on highway/wildlife research and associated impact mitigation techniques.

Ultra-Urban Best Management Practice Assessment and Analysis of Highway Stormwater Runoff (original title); Stormwater Best Management Practices in an Ultra-Urban Setting: Selection and Monitoring (new title) (Completed 1999)

Performer(s): Hagler Bailly Services, Inc. and Tetra-Tech, Inc.

Sponsor(s): FHWA

For more information:

Patricia Cazenias. FHWA, HEPN-30, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-4085; Fax: 202-366-3409; Email: Patricia.cazenias@fhwa.dot.gov.

Abstract

The research will compile available literature on ultra-urban best management practices (BMPs) and develop a searchable database on runoff pollution reduction methods suited to limited space application. Included with the database will be a BMP selection criteria and decision support system and appropriate monitoring design and implementation recommendations.

Use of Native Plants on Roadsides (Completed 1998)

Performer(s): Versar, Inc.

Sponsor(s): FHWA

To order:

Bonnie Harper-Lore. FHWA, HEPN-30, 500 Galtier Plaza, 175 Fifth St. East, St. Paul, MN 55101;
Tel: 612-291-6104; Fax: 612-291-6000; Email: Bonnie.harper-lore@fhwa.dot.gov.

Abstract

Reference material and background information was gathered for this handbook, such as native-region maps for each State, species information, and botanical contact lists.

Natural Environment

Water Quality Research Needs in Transportation (Completed 1993)

Performer(s): FHWA

Sponsor(s): FHWA

To order:

Fred G. Bank. FHWA, HEPN-30, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-5004; Fax: 202-366-3409; Email: Fred.bank@fhwa.dot.gov.

Abstract

This paper highlights a multiyear program of research envisioned by the FHWA to continue the study of water quality associated with highway stormwater runoff. The paper lists proposed studies to examine runoff constituents, monitoring equipment, best management practices, effects on receiving waters, and area-wide impact assessment. It was presented before the Transportation Research Board Committee on Hydraulics, Hydrology, and Water Quality.

Human Environment

Innovative Techniques for Public Involvement in Transportation Planning and Project Development (Completed 1997)

Performer(s): Parsons, Brinckerhoff, Quade & Douglas

Sponsor(s): FHWA; Federal Transit Admin. (FTA)

To order:

Cynthia Williamson. FHWA, HEPH-1, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-2051; Fax: 202-366-3409. Email: Cynthia.williamson@fhwa.dot.gov.

Abstract

The study's purpose was to identify and make available to practitioners innovative and effective public involvement and consensus-building techniques. There were five products: "Public Involvement Techniques for Transportation Decisionmaking"—a collection of short descriptions of more than 100 public involvement techniques (this is available on the Internet); three short case studies of field use of those techniques; and the revision/update of "Improving the Effectiveness of Public Meetings and Hearings," the resource book used in FHWA's basic National Highway Institute (NHI) public involvement course. All of the techniques for improving public involvement are compiled in "Innovations in Public Involvement for Transportation Planning." The three case studies include: 1) "South Sacramento, CA, Light Rail Transit/La Lineal Del Sur," which describes proactive involvement of large and diverse ethnic populations during project development; 2) "Public Involvement at Oregon Department of Transportation," which describes how a State DOT uses a variety of public involvement techniques in both project development and statewide planning; and 3) "Metro Plan (Little Rock, AR) 'Pouring Water on Dry Ground,'" which illustrates how a mid-sized metropolitan planning organization used varied techniques to begin public involvement early in long range transportation planning. "Improving the Effectiveness of Public Meetings and Hearings" was updated to reflect additions to the state of the art since original publication in 1978.

A Look at Our Nation's Highways (Completed 1993)

Performer(s): FHWA

Sponsor(s): FHWA

To order:

Order Nos.: FHWA-PD-94-016; FHWA-PD-94-017; FHWA-PD-94-018.

For more information:

Harold Peaks. FHWA, HEPN-10, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-1598; Fax: 202-366-3409; Email: Harold.peaks@fhwa.dot.gov.

Abstract

A series of 3 brochures containing descriptions of 13 highway projects that used creative and thoughtful approaches to help resolve difficult design challenges. Subjects include linking transportation and recreation, preserving urban and historic districts and rebuilding bridges and communities. Titles: Preserving Urban and Historic Districts (#016); Linking Transportation and Recreation (#017); Rebuilding Bridges and Communities (#018).

Public Involvement Techniques for Transportation Decisionmaking (Completed 1996)

Performer(s): Federal Transit Admin. (FTA)

Sponsor(s): FHWA; FTA

To order:

Cynthia Williamson. FHWA, HEPH-1, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-2051; Fax: 202-366-3409; Email: Cynthia.williamson@fhwa.dot.gov;
URL: <http://www.fhwa.dot.gov/pubstats.html> (Reports & Stats);
Order Nos.: FHWA-PD-96-031; NTIS No. PB97181085.

Abstract

This is one of five products under "Innovative Techniques for Public Involvement in Transportation Planning and Project Development." An expanded collection of short descriptions of 37 public involvement techniques or groups of related techniques, it also incorporates all techniques in "Innovations in Public Involvement for Transportation Planning," including initial steps to implement groups of related techniques. Three case studies: 1) South Sacramento, CA, Light Rail Transit/La Linea Del Sur (1997); 2) Metro Plan (Little Rock, AR) "Pouring Water on Dry Ground" (1997); and Public Involvement at Oregon Department of Transportation (1997). [This is the product of "Innovative Techniques for Public Involvement in Transportation Planning and Project Development," a project also listed in this appendix.]

A System that Serves Everyone — Attracting Nontraditional Participants into the Regional Transportation Planning Process (Completed 1996)

Performer(s): Metropolitan Washington Council of Governments (WASHCOG)

Sponsor(s): FHWA ; WASHCOG

To order:

Cynthia Williamson. FHWA, HEPH-1, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-2051; Fax: 202-366-3409; Email: Cynthia.williamson@fhwa.dot.gov.

Abstract

In 1995, the National Capital Region Transportation Planning Board conducted a public outreach effort among low-income minority and non-English-speaking residents in four communities in Maryland, DC, and Virginia, and senior citizens attending an adult education program in Virginia. The project reached 350 persons through meetings, a traveling van exhibit, and questionnaires. Participants expressed concerns about bus service, fares, pedestrian safety, and the need for better transit information. The report discusses the lessons learned related to the outreach techniques used and the overall approach of target communities and their concerns. "Reaching Out to Everyone: Attracting Nontraditional Participants into the Regional Transportation Planning Process," is a 20-minute videotape made available in fall 1998. It describes the practical lessons learned from an intensive effort to reach a broader range of citizens than have usually participated in its long-range transportation planning. The video can be used by highway agencies nationwide to develop transportation projects that enhance community values and increase public satisfaction with highway projects as a beneficial part of the community.

Human Environment

Transportation Enhancement Conference Notebook (Completed 1994)

Sponsor(s): FHWA

To order:

Harold Peaks. FHWA, HEPH-1, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-1598; Fax: 202-366-3409; Email: Harold.peaks@fhwa.dot.gov.

Abstract

The workshop notebook includes a series of issue papers developed to stimulate discussion during small group sessions. It also includes a status report on the implementation of transportation enhancements, and a State-by-State summary.

Visual Database of Transportation Enhancements CD-ROM (Completed 1996)

Performer(s): FHWA

Sponsor(s): FHWA

To order:

Benita Smith. FHWA, HEPE-1, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-2065; Fax: 202-366-3409; Email: Benita.smith@fhwa.dot.gov;
Order Nos.: FHWA-PD-96-025; HEP-30/5-96(12M)E.

Abstract

A multimedia database containing more than 200 transportation enhancement projects from around the country on CD-ROM. The photos of nominated and winning projects were submitted for the biennial Excellence in Highway Design Awards from the years 1984-1994. Information about the projects includes a written description, photographs, and some video clips. Updated in 1997 as "Excellence in Highway Design Graphic Database CD." Useful to highway designers and the public.

ENVIRONMENTAL JUSTICE

COMPLETED RESEARCH:

Case Studies of Socio-Economic and Environmental Justice Issues Associated with Off-site Wetland Mitigation (Completed 1997)

Performer(s): University of Maryland

Sponsor(s): U.S. Environmental Protection Agency (U.S. EPA); FHWA

To order:

Paul Garrett. FHWA, Colorado Div. Office, 555 Zang St., Room 400, Lakewood, CO 80228;
Tel: 303-969-5772 ext. 332; Fax: 303-969-6727; Email: Paul.garrett@fhwa.dot.gov.

Abstract

This effort developed a simple protocol for evaluating the socioeconomic, distributional, and equity issues associated with the relocation of wetlands from project-site habitat to off-site mitigation areas. The protocol analysis was applied in two watershed areas to determine if off-site wetland mitigation and the incentives for such compensation are having socioeconomic and equity impacts.

CULTURAL, HISTORIC, ARCHAEOLOGICAL, AND SCENIC RESOURCES

ONGOING RESEARCH:

Evaluate Techniques and Methodologies to Rehabilitate Historic Bridges

Performer(s): Louis Berger and Assoc., Inc.

Sponsor(s): FHWA

For more information:

Bruce Eberle. FHWA , HEPH-20; 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-2060; Fax: 202-366-3409; Email: bruce.eberle@fhwa.dot.gov.

Abstract

This is a collection of environmental processes and practices that could result in the rehabilitation of historic bridges. This information will be useful as a resource for those seeking to rehabilitate historic bridges.

COMPLETED RESEARCH:

Building on the Past, Traveling to the Future: A Preservationist's Guide to the ISTEA Transportation Enhancement Provision (Completed 1995)

Sponsor(s): FHWA ; National Trust for Historic Preservation

To order:

Megan Betts. National Transportation Enhancements Clearinghouse, 1100-17th St., NW.,
Washington, DC 20036;

Tel: 888-388-6832; Fax: 202-466-3742;

URL: www.enhancements.org/ or <http://www.railtrails.org/ntec/>.

Abstract

This is a user-friendly guide to transportation enhancement, describing its history, eligible project categories, current requirements, what to expect when applying for funds, and State contact persons. About half of the book describes the wide variety of historic preservation projects completed as part of the transportation enhancement activities of State Departments of Transportation (DOTs) and the FHWA. The booklet demonstrates what can be accomplished by State DOTs and local groups and emphasizes that historic preservation can help revitalize communities and stimulate economic growth. This guide was developed through a cooperative agreement with the National Trust.

Human Environment

Community Impact Mitigation: Case Studies (Completed 1998)

Performer(s): Louis Berger and Assoc., Inc.

Sponsor(s): FHWA

To order:

Cynthia Williamson. FHWA, HEPH-1, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-2051; Fax: 202-366-3409; Email: Cynthia.williamson@fhwa.dot.gov
Order Nos.: FHWA-PD-98-024; HEP-40/5-97(20M)E; NTIS No. PB99111254.

Abstract

This includes stories of five major projects, with an ultimate focus on community impacts from proposed transportation projects, including community values, impact mitigation, and the process used to achieve "win-win." Each case study has a slightly different focus: (1) East-West Expressway, Durham, North Carolina—community mitigation and enhancement; (2) I-696, Oak Park, Michigan—community cohesion; (3) Vine Street Expressway, Philadelphia, Pennsylvania—community preservation; (4) I-90, Seattle, Washington—community reconstruction; and (5) I-165, Prichard, Alabama community revitalization. A chronology and lessons learned are provided for each case study.

Considering Cumulative Impacts under the NEPA (Completed 1997)

Performer(s): Council on Environmental Quality (CEQ)

Sponsor(s): CEQ; FHWA

To order:

Council on Environmental Quality. Old Executive Office Bldg., Room 360, Washington, DC 20502;
Tel: 202-456-6224; Fax: 202-456-2710;
URL: <http://ceq.eh.doe.gov/nepa/ccenepa/ccenepa.htm>.

Abstract

This handbook presents the results of research and consultations by the Council on Environmental Quality (CEQ) concerning the consideration of cumulative effects in analyses prepared under the National Environmental Policy Act of 1969 (NEPA). It introduces this complex issue, outlines general principles and useful steps, and provides information on methods of analysis and data sources. It does not establish new requirements for such analyses. This report is not to be considered as CEQ guidance, nor legally binding. More specifically, it provides a framework for advancing environmental impact analysis by addressing cumulative effects in either an environmental assessment (EA) or an environmental impact statement (EIS). The handbook presents practical methods for addressing coincidental effects (adverse or beneficial) on specific resources, ecosystems, and human communities of all related activities, not just the proposed project or alternatives that initiate the assessment process.

Human Environment

Participate in Archeology (Completed 1994)

Performer(s): National Park Service, U.S. Dept. of the Interior (U.S. DOI)

Sponsor(s): Bureau of Land Management, Bureau of Reclamation, and National Park Service, U.S. DOI; U.S. Dept. of Agriculture; U.S. Dept. of the Army; FHWA

To order:

Cynthia Williamson. FHWA, HEPH-1, 400 Seventh St., SW., Washington, DC 20590;
Tel: 202-366-2051; Fax: 202-366-3409; Email: Cynthia.williamson@fhwa.dot.gov.

Abstract

Archaeological sites are both fragile and irreplaceable and are important to our understanding of our nation's heritage. This brochure provides information about how individuals can participate in archeology through reading, visiting museums, visiting field investigations, or even participating in actual fieldwork. State Departments of Transportation are identified as contacts for more information.

INTEGRATED DECISIONMAKING

ONGOING RESEARCH:

Washington State DOT Demonstration Project to Integrate and Enhance Environmental and Transportation Decisionmaking

Performer(s): Washington State Dept. of Transportation (WSDOT)

Sponsor(s): FHWA ; WSDOT

For more information:

Fred Skaer. FHWA , HEPE-1; 400 Seventh St., SW., Washington, DC 20590;

Tel: 202-366-2058; Fax: 202-366-7660; Email: Fred.skaer@fhwa.dot.gov.

Abstract

The FHWA is partnering with the Washington State Department of Transportation (WSDOT) on an applied research project to develop, pilot, and demonstrate integrated and enhanced environmental and transportation decisionmaking at the Federal, State, local, and tribal levels. This effort will involve a significant change to WSDOT's project development and transportation decisionmaking process, in collaboration with FHWA. The FHWA is interested in this research as a national pilot to demonstrate the following: 1) Integration of the National Environmental Policy Act of 1969 (NEPA) process with the planning, predesign stage, and decisionmaking for surface transportation projects at the earliest possible time; 2) Integration of all applicable Federal, State, tribal, and local permitting requirements; 3) Integration of national transportation, social, safety, economic, and environmental goals with State, tribal, and local land use and growth management initiatives; and 4) Consolidation of Federal, State, tribal, and local decisionmaking to achieve the best overall public interest according to an agreed schedule.

COMPLETED RESEARCH:

Promoting Environmental Sensitivity: Business Organization and Operations (Completed 1995)

Performer(s): The Townsend Consulting Group

Sponsor(s): FHWA

To order:

Benita Smith. FHWA , HEPE-1, 400 Seventh St., SW., Washington, DC 20590;

Tel: 202-366-2065; Fax: 202-366-3409; E-mail: Benita.smith@fhwa.dot.gov.

Abstract

The set consists of an Executive Summary; Volume I—Report on Phase I, Private Sector Environmental Research; and Volume 2—Report on Phase II, State DOT Environmental Research. They profile environmentally sensitive private corporations and State Departments of Transportation. These reports show how several organizations have integrated environmental thinking into their business practices in such a way that environmentally responsible behavior becomes a natural way of doing business, rather than an add-on activity.



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